DOCUMENT RESUME

ED 132 405 08 CE 009 196

TITLE Vocational Education Curriculum Specialist (VECS). Module 4: Assessing Manpower Needs and Supply in Vocational Education. Study Guide. (Teaching/Learning Module).

INSTITUTION American Institutes for Research in the Behavioral Sciences, Palo Alto, Calif.

SPONS AGENCY Office of Education (DHEW), Washington, D.C.

PUB DATE 76

CONTRACT OEC-0-74-9286

NOTE 103p.; For related documents see CE 009 129-136 and CE 009 192-206

EDRS PRICE MF-$0.83 HC-$6.01 Plus Postage.

DESCRIPTORS *Curriculum Development; *Economic Research; Higher Education; Instructional Materials; Instructional Programs; Labor Supply; Learning Modules; *Manpower Needs; *Needs Assessment; Post Secondary Education; *Research Methodology; Secondary Education; Specialists; Study Guides; Teacher Education; *Vocational Education

ABSTRACT

One of 15 core modules in a 22-module series designed to train vocational education curriculum specialists (VECS), this guide is intended for use by both instructor and student in a variety of education environments, including independent study, team teaching, seminars, and workshops, as well as in more conventional classroom settings. The guide has five major sections. Part I, Organization and Administration, contains an overview and rationale, educational goals and performance objectives, recommended learning materials, and suggested reference materials. Part II, Content and Study Activities, contains the content outline arranged by goals. Study activities for each goal and its corresponding objectives follow each section of the content outline. Content focus is on the types of manpower and economic analyses used in vocational education, the use of a variety of sources of employment statistics that directly affect the planning of vocational education programs, and techniques for conducting manpower needs analyses. Part III, Group and Classroom Activities, suggests classroom or group activities and discussions keyed to specific content in the outline and to specific materials in the list of references. Part IV, Student Self-Check, contains questions directly related to the goals and objectives of the module which may be used as a pretest or posttest. Part V, Appendix, contains suggested responses to the study activities from part II and responses to the student self-checks. (HD)

Documents acquired by ERIC include many informal unpublished materials not available from other sources. ERIC makes every effort to obtain the best copy available. Nevertheless, items of marginal reproducibility are often encountered and this affects the quality of the microfiche and hardcopy reproductions ERIC makes available via the ERIC Document Reproduction Service (EDRS). EDRS is not responsible for the quality of the original document. Reproductions supplied by EDRS are the best that can be made from the original.

ED132405

VOCATIONAL EDUCATION CURRICULUM SPECIALIST

VECS

# Module 4:

# Assessing Manpower Needs and Supply in Vocational Eduction

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

STUDY GUIDE
(TEACHING/LEARNING MODULE)

CE 009 196

Developed and disseminated pursuant to Contract No. OEC-0-74-9286 from the U. S. Office of Education under Part I - Curriculum Development in Vocational and Technical Education, Vocational Education Amendments of 1968, Public Law 90-576

by

American Institutes for Research
P.O. Box 1113
Palo Alto, California 94302
1976

DISCRIMINATION PROHIBITED - Title VI of the Civil Rights Acts of 1964 states: "No person in the United States, shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefit of or be subjected to discrimination under any program or activity receiving federal financial assistance." Therefore, the Vocational Education program, like all other programs or activities receiving financial assistance from the Department of Health, Education, and Welfare, must be operated in compliance with this law.

The opinions expressed herein do not necessarily reflect the position or policy of the U. S. Office of Education, and no official endorsement by the U. S. Office of Education should be inferred.

-Study Guide-

Module 4

# ASSESSING MANPOWER NEEDS AND SUPPLY IN VOCATIONAL EDUCATION

This document is one of a series of teaching/learning modules designed to train Vocational Education Curriculum Specialists. The titles of all individually available documents in this series appear below:

INTRODUCTORY MODULES

1. The Scope of Vocational Education
2. Roles of Vocational Educators in Curriculum Management
3. Current Trends in Vocational Education
4. Organization of Vocational Education
5. Legislative Mandates for Vocational Education
6. The Preparation of Vocational Educators

CORE MODULES

1. Important Differences Among Learners
2. Learning Processes and Outcomes
3. Applying Knowledge of Learning Processes and Outcomes to Instruction
4. Assessing Manpower Needs and Supply in Vocational Education
5. Laying the Groundwork for Vocational Education Curriculum Design
6. Selecting Instructional Strategies for Vocational Education
7. Derivation and Specification of Instructional Objectives
8. Development of Instructional Materials
9. Testing Instructional Objectives
10. Fiscal Management of Vocational Education Programs
11. Introducing and Maintaining Innovation
12. Managing Vocational Education Programs
13. Basic Concepts in Educational Evaluation
14. General Methods and Techniques of Educational Evaluation
15. Procedures for Conducting Evaluations of Vocational Education

SEMINARS AND FIELD EXPERIENCE MODULE

(Seminars in Authority Roles and the Curriculum Specialist in Vocational Education, and Leadership Styles and Functions of the Curriculum Specialist in Vocational Education; field work in Project Design and Administration, Operation of School Programs, Evaluation of School Programs, Educational Research and Development, and State, Regional, and Federal Program Supervision)

INSTALLATION GUIDE

For sale by the Superintendent of Documents
U. S. Government Printing Office
Washington, D.C. 20402 Price $_ _ _
Stock No.

# PREFACE

Who is a vocational education curriculum specialist? The answer to this question is not as simple as it might appear. A vocational education curriculum specialist is likely to work in many different capacities, including, but not limited to: instructor, department chairperson, dean of vocational-technical education, vocational supervisor, principal, state or local director of vocational education, and curriculum coordinator.

The specialist is, perhaps, more identifiable by his/her responsibilities, which include, but are not limited to:

- planning, organizing, actualizing, and controlling the work of an educational team performed to determine and achieve objectives.
- planning, organizing, and evaluating content and learning processes into sequential activities that facilitate the achievement of objectives.
- diagnosing present and projected training needs of business, industry, educational institutions, and the learner.
- knowing, comparing, and analyzing different theories of curriculum development, management, and evaluation and adapting them for use in vocational-technical education.

This teaching/learning module is part of a set of materials representing a comprehensive curriculum development project dealing with the training of vocational education curriculum specialists. The purpose of this two-year project was 1) to design, develop, and evaluate an advanced-level training program, with necessary instructional materials based on identified vocational education curriculum specialist competencies, and 2) to create an installation guide to assist instructors and administrators in the implementation process.

The curriculum presented here is, above all else, designed for flexible installation. These materials are not meant to be used only in the manner of an ordinary textbook. The materials can be used effectively by both instructor and student in a variety of educational environments, including independent study, team teaching, seminars, and workshops, as well as in more conventional classroom settings.

Dr. James A. Dunn
Principal Investigator and
presently Director,
Developmental Systems Group
American Institutes for Research

# ACKNOWLEDGEMENTS

The Vocational Education Curriculum Specialist Project was a comprehensive development and evaluation effort involving the contribution of a large number of people: project staff, curriculum consultants, a national advisory panel, and a number of cooperating colleges and universities. This wide variety of valuable inputs makes it difficult to accurately credit ideas, techniques, suggestions, and contributions to their originators.

The members of the National Advisory Panel, listed below, were most helpful in their advice, suggestions, and criticisms.

| | |
|---|---|
| Myron Blee | *Florida State Department of Education* |
| James L. Blue | *RCU Director, Olympia, Washington* |
| Ralph C. Bohn | *San Jose State University* |
| Ken Edwards | *International Brotherhood of Electrical Workers* |
| Mary Ellis | *President, American Vocational Association* |
| George McCabe | *Program Director, Consortium of California State University and Colleges* |
| Curtis Henson | *Atlanta Independent School District, Georgia* |
| Ben Hirst | *Director, Consortium of the States, Atlanta, Georgia* |
| Joseph Julianelle | *U. S. Department of Labor* |
| Lee Knack | *Industrial Relations Director, Morrison-Knudsen, Inc.* |
| Bette LaChapelle | *Wayne State University* |
| Jerome Moss, Jr. | *University of Minnesota* |
| Frank Pratzner | *CVE, Ohio State University* |
| Rita Richey | *Wayne State University* |
| Bryl R. Shoemaker | *Ohio State Department of Education* |
| William Stevenson | *Oklahoma State Department of Education* |

The project would not have been possible without the cooperation and commitment of the field test institutions listed below.

California State University, Long Beach
California Polytechnic State University, San Luis Obispo
Consortium of California State University and Colleges
- California State University, Sacramento
- California State University, San Diego
- California State University, San Francisco
- California State University, San Jose
- California State University, Los Angeles

Iowa State University
University of California Los Angeles
University of Northern Colorado

Overall responsibility for the direction and quality of the project rested with James A. Dunn, Principal Investigator. Project management, supervision, and coordination were under the direction of John E. Bowers, Project Director.

# TABLE OF CONTENTS


| | Page |
|---|---|
| PREFACE | iii |
| ACKNOWLEDGEMENTS | iv |
| PART I. ORGANIZATION AND ADMINISTRATION | 1 |
| Guidelines | 1 |
| Overview and Rationale | 2 |
| Goals and Objectives | 5 |
| Recommended Materials | 7 |
| Suggested References | 7 |
| PART II. CONTENT AND STUDY ACTIVITIES | 9 |
| Goal 4.1 | 9 |
| Introduction | 9 |
| Manpower Needs Analysis (Job Market Analysis) | 11 |
| Inaccuracy of Forecasting | 11 |
| Study Activities | 13 |
| Goal 4.2 | 27 |
| Gathering Manpower Information | 27 |
| Professional Journals | 31 |
| Study Activities | 33 |
| Goal 4.3 | 43 |
| Four Types of Analyses Used in Manpower Forecasting | 43 |
| Employer Surveys | 43 |
| Econometric Studies | 44 |
| Job Vacancy Studies | 45 |
| Extrapolation of Trends Surveys | 46 |
| Literature Surveys | 47 |
| Summary of Manpower Forecasting Techniques | 47 |
| Critical Requirements for a Manpower Forecasting Model | 48 |
| Study Activities | 50 |

# Part I:

# Organization and Administration

# PART I
# ORGANIZATION AND ADMINISTRATION

## Guidelines

This study guide has five major sections. Each section contains useful information, suggestions, and/or activities that assist in the achievement of the competencies of a Vocational Education Curriculum Specialist. Each major section is briefly described below.

PART I: ORGANIZATION AND ADMINISTRATION

PART I contains an Overview and Rationale, Educational Goals and Performance Objectives, Recommended Learning Materials, and Suggested Reference Materials. This section will help the user answer the following questions:

- How is the module organized?
- What is the educational purpose of the module?
- What specifically should the user learn from this module?
- What are the specific competencies emphasized in this module?
- What learning materials are necessary?
- What related reference materials would be helpful?

PART II: CONTENT AND STUDY ACTIVITIES

Part II contains the content outline arranged by goals. The outline is a synthesis of information from many sources related to the major topics (goals and objectives) of the module. Study activities for each goal and its corresponding objectives follow each section of the content outline, allowing students to complete the exercises related to Goal 1 before going on to Goal 2.

PART III: GROUP AND CLASSROOM ACTIVITIES

The "Activities-Resources" column in the content outline contains references to classroom or group activities and discussion questions related to specific content in the outline. These activities and discussion questions

are located in PART III and are for optional use of either the instructor or the student. Both the classroom activities and discussion questions are accompanied by suggested responses for use as helpful examples only--they do not represent conclusive answers to the problems and issues addressed. Also contained in the "Activities-Resources" column are the reference numbers of the resources used to develop the content outline. These reference numbers correspond to the numbers of the Suggested Reference Materials in PART I.

PART IV: STUDENT SELF-CHECK

PART IV contains questions directly related to the goals and objectives of the module. The self-check may be used as a pre-test or as a post-test, or as a periodic self-check for students in determining their own progress throughout the module.

PART V: APPENDICES

Appendix A contains responses to the Study Activities from PART II, and Appendix B contains responses to the Student Self-Check. The responses provide immediate feedback to the user and allow the module to be used more effectively for individualized study. They have been included in the last part of the module as appendices to facilitate their removal should the user wish to use them at a later time rather than concurrently with the rest of the module.

Approximately 30 hours of out-of-class study will be necessary to complete this module.

## Overview and Rationale

Vocational education can be viewed as the bridge between man and his work. It must help one learn skills he is interested in learning, skills that will prepare him for employment, and that will increase his value as an employee. To do this, vocational education planning

should be the result of the careful and continual analysis of both manpower and industry-business needs. Too often students are left to find jobs that no longer exist or for which there is a decreasing demand because someone failed to study the projected manpower needs of society. The purpose of this module is to discuss just how vocational planners can conduct manpower and population needs analyses.

The module is divided into four parts. The first part concerns the meaning of manpower and population needs analyses. Definitions are established here for use throughout the module.

Next the module discusses sources of employment statistics that should be considered when planning vocational education programs. The student will have an opportunity to explore the contents of the best of these sources.

The third part of the module requires the student to complete some of the steps of a manpower or market analysis. Specific instructions are provided to help in conducting the survey.

And finally, the fourth part of the module requires the student to complete some of the steps of a population needs and interest survey. Again, specific instructions are provided.

## Goals and Objectives

Upon completion of this module, the student will be able to achieve the following goals and objectives:

GOAL 4.1: DEFINE AND DIFFERENTIATE AMONG THE TYPES OF MANPOWER AND ECONOMIC ANALYSES USED IN VOCATIONAL EDUCATION.

Objective 4.11 Define task analysis.
Objective 4.12 Define occupational analysis.
Objective 4.13 Define job analysis.
Objective 4.14 Define instructional analysis.
Objective 4.15 Define population needs analysis.
Objective 4.16 Define job market analysis.

GOAL 4.2: USE A VARIETY OF SOURCES OF EMPLOYMENT STATISTICS THAT DIRECTLY AFFECT THE PLANNING OF VOCATIONAL EDUCATION PROGRAMS.

Objective 4.21 Describe the type of information that can be found in the Dictionary of Occupational Titles.

Objective 4.22 Describe the type of information that can be found in the Manpower Report of the President.

Objective 4.23 Describe the type of information that can be obtained from three of the following sources of data:

a. Occupational Outlook Handbook,
b. The Occupational Outlook Quarterly,
c. Tomorrow's Manpower Needs,
d. The National Planning Association,
e. Vocational and Technical Education,
f. Comprehensive Area Manpower Planning,
g. Meeting Tomorrow's Manpower Needs.

GOAL 4.3: EXPLAIN THE PURPOSES OF AND TECHNIQUES FOR CONDUCTING MANPOWER NEEDS ANALYSES.

Objective 4.31 Describe how employer surveys are conducted and used in vocational education.

Objective 4.32 Describe how econometric studies are conducted and used in vocational education.

Objective 4.33 Describe how job vacancy surveys are conducted and used in vocational education.

Objective 4.34 Describe how trends surveys are conducted and used in vocational education.

GOAL 4.4: EXPLAIN THE PURPOSE OF AND THE TECHNIQUES FOR OBTAINING MANPOWER SUPPLY DATA.

Objective 4.41 Describe at least three ways to obtain manpower supply data.

Objective 4.42 Describe how to conduct a survey to determine manpower vocational interests.

## Recommended Materials

Dictionary of Occupational Titles. Bureau of Labor Statistics, U.S. Department of Labor.

Manpower Report of the President. U.S. Department of Labor, published yearly.

At least five of the following references:

a. Occupational Outlook Handbook. Bureau of Labor Statistics, U.S. Department of Labor, published every two years.

b. "The Occupational Outlook Quarterly." Bureau of Labor Statistics, U.S. Department of Labor, published quarterly.

c. Tomorrow's Manpower Needs. Bureau of Labor Statistics, U.S. Department of Labor, 1974.

d. Reports or studies from The National Planning Association, Bureau of Labor Statistics, U.S. Department of Labor.

e. Vocational and Technical Education. U.S. Office of Education, published yearly.

f. Reports or studies from Comprehensive Area Manpower Planning (CAMPS), State Department of Labor or State Employment.

g. Meeting Tomorrow's Manpower Needs, Bureau of Labor Statistics, U.S. Department of Labor, 1974.

## Suggested References


1. Backstrom, Charles H., and Hursch, Gerald D. Survey Research. Evanston, Illinois: Northwestern University Press, 1963.

2. Borgen, Joseph A., and Davis, Dwight E. Planning, Implementing and Evaluating Career Preparation Programs. Bloomington, Illinois: McKnight Publishing Company, 1974.

3. Henderson, John T. Program Planning with Surveys in Occupational Education. Washington, D.C.: AAJC, 1970.

4. Kidder, David E. Review and Synthesis of Research on Manpower Forecasting for Vocational-Technical Education. Information Series No. 54. Columbus: The Center for Vocational and Technical Education, The Ohio State University, 1972.

5. Manpower Research Review Panel. "Developing, Revising, and Updating Curriculum To Meet On-the-Job Needs." American Vocational Journal, 47 (November 1972):pp. 89-99.

6. Meaders, Donald O. Opinion of Parents About Vocational Education. Study of Vocational Education in Michigan. East Lansing: Michigan State University, 1970.

7. Pautler, Albert. "Conceptual Framework for Occupational Curriculum Development." In Contemporary Concepts in Vocational Education, edited by Gordon F. Law. Washington, D.C.: American Vocational Association, Inc., 1971.

8. Rummel, J. Francis. An Introduction to Research Procedures in Education. New York: Harper and Row, 1964.

9. Springfield Area Vocational Center, Springfield, Illinois. Survey instruments.

10. Vocational Technical Terminology. Washington, D.C.: American Vocational Association, 1974.

11. Wenrich, Ralph C.,and Wenrich, J. William. Leadership in Administration of Vocational and Technical Education. Columbus, Ohio: Charles E. Merrill Publishing Company, 1974.

12. Young, Robert C.; Clive, William V.; and Miles, Benton E. Vocational Education Planning: Manpower, Priorities, and Dollars. Columbus, Ohio: The Center for Vocational and Technical Education, The Ohio State University, 1972.

# Part II:

# Content and Study Activities

# PART II
# CONTENT AND STUDY ACTIVITIES

## Goal 4.1

| Content Outline | Activities-Resources |
|---|---|

**Goal 4.1: Define and Differentiate Among the Types of Manpower and Economic Analyses Used in Vocational Education.**

A. Introduction

1. The development of vocational curricula is unique in the field of education. Vocational education is based on an integrated and continuing process of analyzing the industries and individuals it serves. Program planning must begin with the analysis of three areas of concern: first, an analysis of the manpower needs and opportunities of the businesses and industries that make up society; second, an analysis of the population or student needs and interests; and finally, an analysis of the constraints and the resources with which the school system and the economy must operate.
2. Manpower Needs Analysis (Job Market Analysis). Manpower needs analysis attempts to relate program development to future economic demands for the production of goods and services. Its main emphasis is the employment needs of industry and business. Manpower needs analysis is the same as job market analysis. It asks

the question, "What occupations, or cluster of occupations, will in the future need skilled employees to meet society's demand for goods and services?" (10)

3. Population Needs Analysis. Population needs analysis attempts to forecast and assess consumer preference and demand for education. Its emphasis is on the characteristics, interests, and training needs of the manpower supply. The manpower supply is simply all of those men and women who are employable. Population needs surveys ask the question, "What do students, parents, and the taxpayer in the community want to study, which occupations do they aspire to, and how should instruction be made available?"
4. Constraints and Resources. Constraints and resources are considered to ensure maximum achievement of a given goal and minimum use of resources to achieve that goal.
5. Curriculum planning involves the study of employment demands, resources, and the cultural-intellectual level of the probable student population. Of this broad array of forces, however, the student must be the focal point. The purpose of vocational education, the preparation of students for the world of work, must ultimately include consideration of the self-fulfillment needs of students.

Vocational education programs must incorporate manpower needs analysis, but not limit that

(10) Vocational Technical Terminology.

analysis to a local geographic area. As long as there are existing jobs within the practical mobility potential of the student, preparation for those jobs should be considered by curriculum planners (11).*

(11) Leadership in Administration of Vocational and Technical Education.

* See Discussion Questions A and B in Part III.

B. Manpower Needs Analysis (Job Market Analysis)

Vocational education is education for employment, and since the Vocational Education Act of 1963 and the 1968 Amendments state that training shall be provided "which is realistic in the light of actual or anticipated opportunities for gainful employment," those responsible for curriculum planning must necessarily analyze manpower supply and demand. However, manpower needs analysis is not used as frequently as it should be by vocational educators. Why?

C. Inaccuracy of Forecasting

1. Manpower forecasts are frequently inaccurate for several reasons, including the following:
   a. Statistical and sampling procedures are inappropriate. Also, the study may use materials that are no longer current or correct.
   b. The economic and political climate within which forecasts are made is unstable. (For example, political instability resulted in many people being laid off at the Boeing plant in Seattle. When national policy placed less emphasis on space programs, the need for rockets and space

equipment lessened, and fewer employees were needed by the plants.) Also, shifts in military (space program), social (childhood education), and state priorities change manpower needs greatly.

So, manpower forecasting is not a science. The studies and, consequently, the resulting data are not always accurate and therefore are not totally dependable. Short-range forecasts, however, are more accurate than long-range forecasts.

c. The future is currently forecast as a projection of past performances. However, with automation and technology accelerating at a very rapid pace, past performance cannot be the sole criterion of a forecasting model (2).

(2) Planning, Implementing, and Evaluating Career Preparation Programs.

D. Study Activities

*Based on your reading of the content outline and any additional references as suggested, complete the following activities.*

A Definition of Terms

The terms used in manpower analysis and population needs analysis are often defined incorrectly or are used interchangeably. In order to avoid confusion, definitions are provided here that will be used throughout the module.

Task Analysis. Task analysis is the process of determining the major tasks of a job and synthesizing the knowledge and skills required to perform these tasks.

Tasks are the manipulative and cognitive performances that are necessary to do a job. A task generally requires some combination of skills and knowledge, that is, it requires both physical and mental action on the part of the worker. Each task has a definite starting and stopping point. A job may consist of only one task or it may be made up of a series of interdependent tasks. In the latter case, the tasks normally must be completed in proper sequence if the job is to be done satisfactorily. Tasks, then, are the step-by-step process of completing a job. Each of these tasks is the smallest unit of job activity having a specific purpose.

Here are some examples of tasks along with physical skills and knowledge required of them:

| Task | Necessary Skills and Knowledge |
|---|---|
| 1. Selects materials | a. knows source of materials and location<br>b. selects proper material<br>c. measures proper quantity |
| 2. Records data | a. records information accurately<br>b. includes all details<br>c. makes legible notes |

Research and experience are in agreement that while cognitive and manipulative skills are essential to any task or job, a basic part of all tasks and jobs is the affective factors--values and attitudes. While skills and knowledge are relatively easily identified, the values and attitudes that make up the affective domain are not. However, since success or failure on the job is most often dependent on the values, judgments, and attitudes that the employee holds regarding his job, values and attitudes must be identified along with skills and knowledge so that instruction and the learning process can consider all three realms of learning.

Occupational Analysis. Occupational analysis is the process of determining the jobs performed by individuals employed in the key occupations of a cluster, and of synthesizing them into a composite of operations that are common to, and representative of, the key occupations identified in the cluster. Occupational analysis results in a detailed, systematic listing of the performance elements of an occupation and the technical and general knowledge needed to perform adequately.

Job Analysis. Job analysis is a listing (in performance sequence) of the steps or processes of a job or task together with the safety measures, technical information, and procedures concerned with its accomplishment. It usually includes the tools, machines, and materials used in completing the job or task. A job analysis is specific. It refers to one particular job or to related tasks that are usually assigned to one individual. This is in contrast to occupational analysis, which is general and refers to related jobs within an occupational cluster (10).

Instructional Analysis. An instructional analysis is the process of analyzing and separating knowledge and physical skills into logical systems of related instruction, and stating them in expected behaviors that can be measured by the classroom teacher, student, school counselor, and employer. The aim of instructional analysis is to sort through the many tasks that make up a job and decide which ones are suitable for

classroom instruction, for on-the-job instruction, and so on. The result of instructional analysis is instructional objectives that are sequenced in a logical order (10).

Population Needs Analysis. Population needs analysis is a system for obtaining and maintaining population data that will provide the information necessary for planning vocational education programs. The information includes data relating to the needs of the local population. Such data may include population vocational interests, needs, skills, and learning or physical disabilities (10).

Job Market Analysis. Job market analysis is one that provides comprehensive, systematic, and continuous information on available and emerging job opportunities. It may provide local, regional, or national data. Job market analysis is also referred to as manpower needs analysis and manpower needs surveys. A variety of techniques can be used to gather job market data, such as sophisticated econometric studies, simple job vacancy and employer surveys, or general extrapolation of trends surveys. All these techniques have the same goal: to determine job market needs and opportunities for employment, both in the present and in the future, thereby enabling vocational planners to provide appropriate vocational training programs (10).

1a. Define the following terms:
   a. task analysis
   b. occupational analysis
   c. job analysis
   d. instructional analysis
   e. population needs analysis
   f. job market analysis

b. Explain the differences between the following types of analyses:
   a. occupational analysis and job analysis
   b. task analysis and instructional analysis
   c. job market analysis and population needs analysis

2. Read the article by the Manpower Research Review Panel, "Developing, Revising, and Updating Curriculum To Meet On-the-Job Needs," provided on the following pages. This article will give you an overview of the process of developing curricula and will point out where the process of determining manpower needs and population needs belongs. When you have completed the reading, answer the questions below.

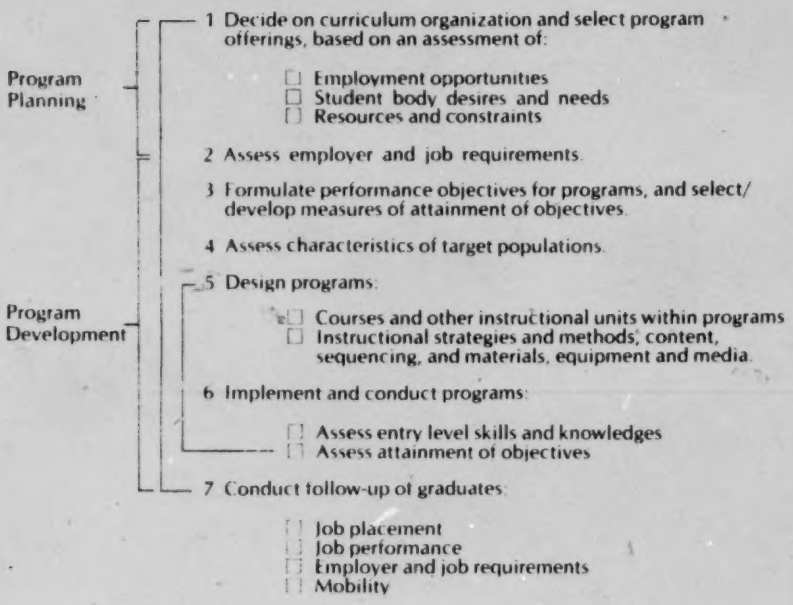
   a. Decisions on what programs to offer should be based on three sources of information. List these three sources of information.

   b. In order to assess the importance of tasks required for a job, a survey should be conducted to collect information regarding the job. What are the four questions that should be asked?

*(See Appendix A for possible answers.)*

# Developing, Revising and Updating Curriculum To Meet On-the-Job Needs

**Steps in Curriculum Development, Revision, and Updating**


Program Planning
1 Decide on curriculum organization and select program offerings, based on an assessment of:
☐ Employment opportunities
☐ Student body desires and needs
☐ Resources and constraints
2 Assess employer and job requirements.
3 Formulate performance objectives for programs, and select/develop measures of attainment of objectives.
4 Assess characteristics of target populations.
Program Development
5 Design programs:
☐ Courses and other instructional units within programs
☐ Instructional strategies and methods, content, sequencing, and materials, equipment and media.
6 Implement and conduct programs:
☐ Assess entry level skills and knowledges
☐ Assess attainment of objectives
7 Conduct follow-up of graduates:
☐ Job placement
☐ Job performance
☐ Employer and job requirements
☐ Mobility

Deciding what jobs or trades to teach is a prime challenge to vocational educators. Often these decisions turn on the availability of equipment and the qualifications of the teaching staff. They are also shaped by other resources and constraints—the size of the student body, the tax base, the cost and duration of training for entry-level proficiency in a particular trade, state regulations, and so forth. Within these limitations, wise decisions on course offerings depend fundamentally on knowledge of employment opportunities and students' interests and needs.

To gather and weigh the evidence on these fundamentals is the first of seven steps in the method outlined in the Battelle study for developing, revising, and keeping vocational education programs up to date. None of them is new, and all schools perform some of them—albeit in various ways and with varying degrees of effectiveness. Thus, in carrying out the second step—assessing employer and job requirements—for ten occupations in three school districts in Michigan, Battelle found—

- One school district still offering two years of traditional bookkeeping instruction, training students for jobs which did not exist in large companies and were not open to inexperienced workers in small firms.
- Another district turning out graduates of its automobile engine mechanic curriculum who often lacked proficiency in the skills demanded in entry-level jobs, in part because they could not read instructions or do simple arithmetic.
- Two districts whose stenographic and typing graduates often failed to meet employers' standards for accuracy and speed, that is, about 50 words per minute in typing and 90 in shorthand.

These and other deficiencies were attributed partly to the schools' lack of knowledge of employers' requirements for entry-level workers or how their graduates fared on the job. But the study also found a general failure to state the objectives of instruction in terms of desired behavior and performance and to base promotions on the students' meeting specified standards.

To overcome discrepancies between the skills that employers demand and those which students acquire, the study

made both general and specific recommendations for each occupation. The latter pertain to the school districts where the study was conducted and hence may not be relevant for other school districts. The general recommendations, however, should have broad application to establishing or restructuring vocational education programs. They are reproduced at the end of this article.

But the major objective of the study was to develop a method which school systems could use to reduce discrepancies between employer-desired skills and curriculum-produced skills. As already indicated, the method has seven steps:

1. Decide on curriculum organization and select program offerings.
2. Assess employer and job requirements.
3. Define the objectives of the program and devise measures of success in meeting those objectives.
4. Assess the characteristics and capabilities of students.
5. Design the curriculum.
6. Put the program into operation.
7. Conduct follow-up studies.

The approach is, in effect, a continuous process for updating and revising the curriculum to assure that program offerings fit students' interests, needs, and employment opportunities; that program objectives are matched to students' characteristics and changing job requirements and formulated to meet these requirements; and that programs are designed to meet program objectives.

Steps 4, 5, and 6 are activities normally performed by all school districts as a part of their educational program and are touched upon lightly in the following discussion of the major features of the recommended approach.

**Deciding on Program**

Decisions on what to offer should be based on information about current and emerging employment opportunities for vocational graduates, students' interests and needs, and local resources and constraints.

That resources and constraints are often a major problem for the local school district is nowhere more evident than in this planning phase. Many districts have great difficulty in finding the time and money to conduct the necessary studies to obtain the information, and lack the staff capabilities to interpret the results of the studies.

Another problem in assessing employment opportunities is a philosophical one, centering on the issue of whether using employment opportunities as a basis for curriculum meets the needs of students. True, basing curriculum on employment opportunities caters to the employer's desire for workers with the specific skills he needs. At the same time, however, it meets the student's needs, for he does not want training in a trade where he cannot get a job when he graduates.

Another basic issue concerns the geography of employment opportunities for which students should be prepared. If many graduates leave the area, they need training for jobs to be found beyond the community. If they tend to remain in their home locale, then job opportunities in the area should guide their education. Hence, studies of students' mobility must shape the answer on the geographic coverage of the information on job opportunities. But providing skill training peculiar to local needs can itself inhibit mobility.

Mobility is also an issue in deciding how much emphasis should be put on current vs. future job opportunities. Leaving aside questions of the obsolescence of facilities and equipment, the crucial element in this decision is that the new graduate must face today's conditions, not those which may exist in 10 years. But he can be given some protection against occupational changes. Both declining opportunities and growing opportunities can be identified and training can be given for clusters of similar occupations. Reasonably accurate projections of employment opportunities can be obtained from the *Occupational Outlook Handbook*, from information provided by the local Employment Service Office, and from a mail survey of local businesses and industries. Such a survey could be planned and conducted effectively by school guidance and counseling personnel, so long as they emphasize specific occupations rather than such broad categories as "health occupations."

Within the limits of probable job opportunities, meeting students' interests and needs calls for a wide range and variety of offerings. Programs are needed for the disadvantaged, the underachievers, and other groups having special needs. The range and variety of course offerings are often severely limited by the tax base and the size of the student body. The simple fact that a small school district cannot provide a wide range of offerings or any kind of in-depth training is often forgotten in the debates over whether vocational education should be given in area vocational schools or in a traditional high school setting. The area schools have in fact provided opportunities to students who did not have comparable opportunities before.

**Assessing Requirements**

Step 2 calls for an assessment of employer and job requirements for the various occupations selected in the planning step, by use of various survey and task analysis procedures, and by use of advisory and craft committees.

As a supplement to the use of advisory committees for reflecting employers' skill needs, relatively simple surveys can provide more specific and comprehensive information. The surveys can also supplement the periodic training needed by staff instructors to keep them up to date in their job specialty.

Well defined and specific task and skill information is needed for efficient program development. The information should describe required tasks and skills for a trade in the several work settings where the trade is practiced, so that differences and commonalities can be assessed.

The survey method used in the Battelle study is suitable for use by school districts. It requires the defining and listing of tasks an individual performs on the job and grouping these tasks into task classes. For each task, the following information is needed:

1. Importance of the task for hiring, job success, and promotion.
2. Frequency of performance of the task.
3. Proportion of employers desiring that the task be taught in the school.
4. Level of proficiency required on the task.

To obtain this information, the school district should:

1. Develop a comprehensive preliminary list of job tasks for each job. Vocational teachers can develop this list from their own expertise and written curriculum materials.
2. For each job and trade, select a representative group of employers of various sizes and in different industries where workers are employed in the job or trade. Usually six to eight establishments will yield representative information.
3. Survey the establishments selected. Ideally, a vocational teacher from the occupation would present the preliminary task list to appropriate personnel in the establishments, such as workers performing the job, first line supervisors, and others such as the personnel staff who are able to provide the information required. These people would add to or delete from the preliminary list of tasks as necessary. They would also be asked for information on how important the ability to perform the task is in decisions on hiring and promotion, how many entry-level workers can perform the task, how often the beginning worker needs to perform the task, and how well he must be able to do it. Those interviewed would also be a source of information on equipment, tools, materials, and instruments required in the performance of the tasks.

The resulting information for one of the occupations in the Battelle study is presented and analyzed at the end of this article, to illustrate the technique. The Department of Labor plans to issue comparable information for all 10 of the occupations in booklet form.

With the revised task listing for a job, curriculum specialists at the school can break tasks down into more detailed task steps and units and determine what skills and knowledge are required for performing each step. This information then provides the basis for formulating courses and other instructional units that will attain program objectives.

### Defining Objectives

The overall objective of a program is defined by the capabilities (skills, knowledge, attitudes) the student is to have when he completes or leaves the program. Each unit in the curriculum has a specific objective which, taken together, comprise the overall goal of the program.

Current technology calls for stating objectives in terms of student performance. In particular, performance or behavioral objectives should:

1. Describe the intended results of instruction, not its content, or methods, or teacher behavior, or student learning experiences in the program.
2. Specify what the learner is to be able to *do* upon completion of instruction.
3. Specify the conditions under which the learner is to display the desired behavior; for example, with or without the assistance of job aids.
4. Specify what *level of performance* is considered acceptable; for example, the standards of accuracy, and the length, speed, rate, etc. of the response.
5. Express desired behavior in specific terms which can be measured.

Stating objectives in performance terms provides a clear and unambiguous starting point for design of the learning environment. When committed to writing, the statement will:

1. Further clarify the skills and level of performance that are desired to be taught;
2. Increase the likelihood that provisions will be made for teaching all skills and behaviors that teachers have in mind;
3. Demonstrate to others that program personnel have a clear idea of what is being taught;
4. Facilitate communicating to students and parents the objectives which educators have in mind;
5. Insure systematic coverage in measures of the attainment of objectives, and also provide a way to demonstrate that the measure is matched to the objective.

The behavioral objectives approach requires time and special effort. However, once behavioral objectives are written, it is much easier to update them.

Two strategies can be applied to stating objectives. In some cases, the objectives will literally provide for the teaching of required job tasks. In others objectives will be stated in terms of skills, knowledge, and other capabilities required for successful task performance. School training, in this latter case, stops short of literally teaching actual job tasks, but instead provides for certain required capabilities with the assumption that job experience will lead to successful task performance. Which of these strategies to employ, or which combination of the two for a given job, depends on the job itself along with resources, constraints, and other factors.

### Task Selection

Information obtained during task analysis (such as importance, frequency, and prevalence of the task) can provide guidelines in selecting tasks and associated skills and knowledge to teach. Also, estimates of learning difficulty for the various tasks can provide another criterion for task selection. Constraints on time and funds may not permit the teaching of all job tasks at the required level of proficiency, and tasks unique to a particular establishment may be better learned on the job. Student characteristics make it unrealistic to teach certain aspects of a job or toward certain levels of proficiency. The unavailability of expensive equipment is another consideration.

But the ease and validity with which program objectives can be formulated depends directly on how well job requirements have been assessed. If a well-defined description of required job tasks and associated skills, knowledges, and proficiency levels is not available, then formulation of program objectives presents problems.

### Measuring Success

In an objectives- or outcome-centered approach to instruction, "evaluation" is accomplished by measuring the extent to which objectives are achieved. That is, the "worth" or "value" of a program is not judged by whether it meets standards based on operations or resources, such as supplies and materials and teacher behavior. Nor is the effectiveness of instructional materials judged by expert opinion. Rather, a program is judged in terms of student learning: If students achieve specified goals, the program is effective; otherwise, it is not. Evaluation, then, examines the "product," not the "process" or resources used.

This is not to say that the educational process is never examined in an outcome-centered approach. The educational process is continually examined to search out and define less costly ways of achieving given ends. If objectives are not being met, a major part of the approach is to examine the processes, methods and instructional materials so that necessary changes can be prescribed. Based on this assessment, programs are redesigned as necessary, until objectives are achieved.

This provision for feedback and program redesign puts the burden of responsibility for student learning on the system. If instruction fails, it is not the student's fault, but rather the fault of the system. Phrased differently, the educator's job is not complete when "information is presented," but when the student learns. Of course, student performance assessment is a common function in schools; however, whether such testing is systematically used as a means for revising instruction is questionable.

In a behavioral objectives approach, a test becomes simply a device for measuring the extent to which students have acquired the specified behaviors, rather than measuring such imponderables and intangibles as "understanding," "knowledge," etc. Although this approach simplifies the measurement of human performance, the measurement may be subject to rather severe constraints if it requires the use of expensive equipment that may not be readily available for all students to use in a testing situation. Other technical problems associated with test construction (e.g., test reliability) are also present, but do not pose serious or major problems.

Measures should be selected or developed for *each* behavioral objective stated. The problem is to find out, for each objective, how well students perform, thus providing a diagnosis of what parts of the system need improvement.

Classical test construction procedures (often called "norm-referenced" measurement) are based on the premise that the purpose is to compare students with each other. When the purpose of the test is to assess whether a given performance standard is met (often called "criterion-referenced" measurement), a considerable amount of test development is entailed.

**Follow-up Studies**

The final measure of performance is a follow-up study to determine whether the graduate acquired skills and levels of proficiency appropriate to the job for which he was trained. The intent is to test the validity of the objectives by comparing the performance of graduates who have achieved the objectives set forth in the curriculum with the skills and proficiency needed to get and hold a job in an area of employment for which they were trained. If a discrepancy is found, there is a need to *reduce* the discrepancy and set new objectives in the curriculum.

In identifying and isolating a discrepancy, there are two primary sources of information, the employer and the graduate. The graduate can examine the extent to which his vocational instruction gave him the skills required to perform adequately on the job. The employer can make a similar assessment. The procedures require the use of the task analysis data.

The procedures selected for a follow-up study should be designed to determine how well the curriculum specialists are making the decisions which determine the scope of skills and levels of proficiency acquired by students before entering the job market. The procedures should allow for the collection of information which serves as a final check for the curriculum specialists and permits them to modify and improve upon their selection of objectives.

Data from the recent graduates should focus on the task list developed in the original analysis, to answer the following questions:

- What proportion of the tasks covered in the class are required on the job?
- What is the importance for job performance of tasks on which instruction was received?
- How adequate was the instruction for different tasks?
- If the instruction was unsatisfactory, what is needed to improve it?
- Are any tasks for which no instruction was given critical in the performance of your job?

Most of the information can be processed and the discrepancies identified through the services of computer operations if desired. The analysis of the graduates' diagnostic statements about particular tasks and statements concerning additional tasks cannot be performed in this manner. However, information processed by computer can isolate tasks for which the diagnostic information should be reviewed. Therefore, it would not be necessary to review all of the graduates' diagnostic inputs. A review should be made, however, of the graduates' comments concerning the inclusion of tasks not previously included in the initial task analysis.

The employer's role in the follow-up process should also concentrate on providing information concerning what tasks are important for performing successfully on the job, how well the graduate performs those tasks, and what tasks, if any, are critical but not included. For important tasks which the graduates are not performing adequately, diagnostic detail should be provided.

In summary, the information received from a follow-up study of vocational graduates working at a trade for which they have received training benefits curriculum programs in the following ways:

- It provides for a systematic reduction in the discrepancy between the skills and levels of performance the graduate acquires and those he needs to perform successfully on the job.
- It completes the cycle of task analysis by including the graduate as a source of input data.

The use of follow-up information closes the loop in the process of program development and simultaneously provides for appropriate modifications to upgrade programs where required.

Let us now look at a specific example from the Battelle study to see what kind of information comes out when this system is applied.

The material is taken from an actual study conducted in a Michigan community which, for our purposes, has been renamed "Battelle."

**Sample Analysis: Food Service**

In the food service industry, the fourth largest industry in the United States, there are at least three general levels of skill requirements. These are dependent upon the type of establishment in which the individual is employed. For the small, independently owned and managed, cooked-to-order (short order) type restaurant, unskilled or semi-skilled workers are needed. For the quality cooked-to-order restaurant, skilled cooks and unskilled or semi-skilled workers are needed. For the growing chain and franchise restaurant industry and for many institutions, management level people and unskilled or semi-skilled workers are needed.

Although there is a need for skilled workers in the commercial foods industry, the grater need has always been for unskilled or semi-skilled workers.

In the area of actual food preparation, the only place where extensive training is now a distinct advantage is in the high quality cooked-to-order restaurant and hotel, in some institutions, and in originating recipes for the prepared foods industry. (The prepared foods industry needs a small number of trained cooks who are highly creative to originate and test new products. After the development phase, the product is put on an assembly line basis, where little cooking skill is needed.)

In the high quality, cooked-to-order restaurant, vocational training is generally helpful for entry as a baker, butcher, pantry worker, or the more skilled cooking jobs. However, most entry jobs do not have specific education requirements and most entry personnel come in as kitchen helpers or as less skilled cooks. They are expected to start at lower skill jobs and work their way up. Students can improve their opportunities by taking culinary courses and employers do prefer a high school education.

Individual methods in cooking differ to the extent that it often takes years of experience in the industry to achieve the necessary skill and reputation to become a chef in a high quality restaurant. Once a reputation has been gained, it is possible to make very good wages.

Because of the standardization, control, and use of prepared foods in the chain and franchised restaurant business, less skill is needed for the terminal preparation of food acceptable to the public. The general cooking skills needed are in heating prepared products, often by means of a microwave oven, or in very basic cooking, such as frying ground beef patties.

The greatest need in this segment of the industry is for people with specialization training who can qualify as managers, assistant managers, buyers and other supervisory positions. They should be more management-oriented in their training rather than trained only as a cook, although some culinary courses are critical. They should have a knowledge of union practices from a manager's point of view, know health regulations in detail, and be able to prepare reports required by most chain and franchise businesses.

**Staff**

At the time this study was conducted, there were seven instructors on the Battelle High Commercial Foods Department Staff. All were vocational certified teachers with extensive trade experience. The Cooking II and III instructor was French-born, had two years of college training, and over 40 years of trade experience. The Cooking I instructor had 15 years of trade experience and was a graduate of the Battelle High Commercial Foods Department

**Facilities and Equipment**

The Department had modern, well-equipped laboratory facilities to accommodate every aspect of commercial foods preparation. Included in these facilities were a cafeteria and dining room, baking and hotel pastry-making laboratory, commercial cooking laboratory, and one of the finest meat cutting facilities in the country.

The chef/cook facilities included all the necessary utensils; meat grinder; potato peeler, mixers, buffalo chopper; four gas ranges and ovens; gas and electric deep-fat fryers; gas broiler; pressure cooker; two steam stock pots; refrigerators, freezers, and dishwashing and pot washing set ups.

Supplies and instructional materials were found in quite ample quantities and were appropriate for the planned training experiences.

**Admission of Students**

Students were enrolled in commercial foods if they met the following requirements:

- Completed the ninth grade.
- Achieved satisfactory grades.
- Maintained a good attendance and citizenship record.
- Showed a genuine interest in learning the food business.
- Completed a written application form.
- Obtained a food handler's permit.
- Were recommended for the program by a school counselor.

**Curriculum**

All tenth grade commercial foods students received exploratory experiences in six phases of food preparation (i.e., food service, cooking, baking, pantry, meat cutting, and pastry). During the second and third years of the program, the students specialized according to their interests and capabilities. Those specializing in chef/cook took Cooking I, II, and III.

Cooking I consisted of instruction and practice in the operation of all equipment; learning the proper terminology and spelling of foods and materials; and preparation of food for the department cafeteria and catering orders.

Once a student had completed Cooking I, he then familiarized himself with more complex work in cookery. In Cooking II, the students were provided learning experiences in menu construction, preparation of stocks, neutral sauces and compound sauces, variations of soups, consommes, broths, potages and cream soups.

They learned roasting of meats, braising, stewing, pan-frying, deep frying and broiling, and all phases of fish and seafood cookery.

Cooking III included experiences in garde-manger work: preparation of hot and cold hors d'oeuvres, decoration of foods, tallow work, ice carving, aspics, all relative to food displays for buffets and special occasions. Practical experience was gained through preparing food for the teachers' dining room and special luncheons and banquets.

**Evaluation**

The Battelle Chef/Cook Program was most adequate as far as traditional food preparation is concerned. The facilities

were modern and well-equipped. The curriculum included appropriate opportunities for students to learn the theory of food preparation and to practice their acquired knowledge. The instructional staff was highly qualified. In general, the program graduated well-qualified students for entry-level positions in traditional food preparation.

**Executive Chef**

The employer interview guide included task statements for the position of executive chef. In general, the employers indicated that entry-level personnel were not able or expected to perform these tasks. Therefore, the following tasks are not usually performed by an entry-level chef/cook employed in the Battelle area:

Prepares menu.

Plans menu selections utilizing meat trimmings and other leftovers.

Plans cooking schedule to produce required items when needed.

Reviews cost records to detect unusual expenses and determines methods of reducing costs, e.g., substituting ingredients or revising cooking methods.

Estimates required food quantities by reading prior consumption records and banquet schedules and using professional judgment.

Compares supplies on hand with estimated requirements to ascertain ordering requirements.

Orders supplies from vendors.

Coordinates activities of other cooks and kitchen workers.

Hires new kitchen personnel and terminates their employment when necessary.

Meets with the customers in a good-will capacity.

**Employer-Desired Skills**

The following tasks, by classification, are those which the employers considered to be important at the entry level. A bullet (•) preceding a task indicates that a majority of the employers considered the task both "required" and "of great importance" at the entry level.

**All Cooks**

Read menu to ascertain what items to cook.

Obtain needed ingredients from stockroom, cookers, and freezers.

• Weigh and measure ingredients of recipes to provide the proper number of servings.

• Decide from experience those products which require the longest baking time and schedule the mixing of ingredients accordingly.

• Adjust thermostat controls on ovens, stoves, broilers, grills, deep-fat fryers, and steam kettles to bring to predetermined cooking temperatures.

• Add spices or seasonings to food according to recipe, personal judgment, and experience.

• Baste meat with natural juice or with a sauce to prevent drying out and to season.

• Test food being cooked by smelling, tasting, and piercing with a fork to determine state of cooking.

Observe consistency and color of cooking food in order to remove from cooking surfaces or pots at exact state of readiness.

Remove food from oven or range when cooked and place in holding oven or on steam table to maintain serving temperature but to prevent food from cooking further.

Garnish serving dishes in attractive manner and place them on serving counter.

Portion food on dinner plates or in chafing dishes for serving.

**Specialty Chefs**

Schedule baking time so that products are as fresh as possible at serving time and so that ovens are used to maximum efficiency.

Take over duties of head chef in his absence.

Fill soup kettles with stock, add meats, vegetables, and seasonings as required.

Prepare stocks and soup.

Portion soup.

• Prepare and cook ingredients for sauces.

• Add sauces and gravies to serving dish as indicated on menu or according to customer request.

Season and bread meats, seafood and fowl for baking, roasting, broiling, frying.

Wash and wrap potatoes in aluminum foil to prepare for baking.

• Bake, roast, boil, fry, broil, or steam meats, seafood, fowl, vegetables, and fruits.

Place prepared patties of hamburger, slices of ham, pork chops, cutlets, and sausage onto an electric grill and cook to desired stage.

Mash potatoes by hand or with a power mixer.

**Pastry Department**

Mixes, chafes, and bakes bread, rolls, cakes and other pastries according to recipe.

Prepares appropriate toppings or icings as baked products are removed from oven and set aside.

Pours and spreads icing on cakes and pastry being sure that there is uniformity and that appearance of finished product is attractive.

**Garde-Manger and Pantry Department**

Prepare dressings.

• Prepare body of salad.

Dress salads and appetizers.

Prepare hors d'oeuvres, canapes, and other appetizers.

Prepare special items for buffet or smorgasbord.

Carve cooked meats by hand or by using an electric slicing machine.

Make cold meat, chicken, or tuna fish salad sandwiches.

Prepare other ingredients and garnishes for sandwiches.

Cut and plate pies and cakes.

Dish desserts.

Prepare coffee, tea, hot chocolate.

Pour juices or beverages.

Prepare cereal.

Prepare waffles, hot cakes, muffins, and toast.

**Butcher**

Removes required cuts of meat or seafood from freezer or refrigerator.

• Cuts beef, lamb, pork or fish into prescribed portions for steaks, chops, and fillets, using knife or bandsaw.

Cuts, trims, bones, and slices meats, seafood, and fowl to prepare for cooking.

Rolls roasts and ties them with string.

Grinds cuttings of beef or pork in electric grinder to make ground beef or sausage.

**Receiving Clerk and/or Storeroom**

Counts or weighs food and beverage to verify amount or weight shown on

Below is one sheet describing an entry-level occupation in terms of job tasks an employee may have to perform at that level. As many additional sheets as necessary are added as the tasks become more specialized or specific.

This sheet shows that all seven employers interviewed believed proficiency in the first task was desirable on the job. The employers' opinions were split on the actual abilities of graduates to perform the task, with the majority saying "none" performed the task. There was also a split on the importance of the task at entry level and as vehicle for promotion. The frequency with which the task was employed and the level of proficiency of graduates in task performance were rated "High," "Medium," or "Low."

invoice of delivery.

Inspects incoming food and beverage for quality and freshness and reports any item that is not of suitable quality.

Receives and stores fresh linen, cleaning supplies, etc.

Places supplies in a dry area, storeroom refrigerator, or freezer as required.

Rotates supplies so that older goods are used first.

Issues supplies to cooks upon request.

**Kitchen Steward**

Directs activities of utility workers (dishwashers, garbage detail, etc.).

Cleans and scrubs work area and refrigerator as required.

• Inspects kitchen area to detect evidence of unsafe or unsanitary conditions.

**Employer-Desired vs. Curriculum-Produced Skills**

According to the employers interviewed, relatively few entry-level personnel can satisfactorily perform the tasks listed as being performed by "all cooks." In general, it was found that the more important the task is to the quality of the final product, and the greater the amount of personal judgment that must be used, the fewer the number of entry personnel who could perform the task.

Tasks performed by an assistant or specialty chef (soup, sauce, roasting, frying, vegetable) were generally low in terms of the number of entry personnel able to perform them. Exceptions were tasks requiring less skill (e.g., portioning soup, adding sauces and gravies to serving dishes, frying slices of meat or patties of ground beef, etc.).

Tasks performed by the pastry and pantry departments were generally higher in the number of entry-level personnel able to perform them.

Tasks performed by a butcher in some restaurants were generally low in the number of entry-level personnel able to perform them. A number of employers, however, pointed out that entry personnel who have had butchering courses in high school can perform these tasks quite well. Tasks performed in connection with the reception of supplies, the care of the stockroom, and utility-type work were usually high in the number of entry-level personnel able to perform them.

In general, it was the opinion of most employers that the average entry-level cook is unskilled in his ability to perform a great number of important tasks. It should be noted that the great majority of entry-level people are not graduates of Battelle High School, nor have they had formal training in cooking methods.

The analysis of the curriculum-produced skills of the Battelle High chef/cook program revealed that there were no discrepancies between curriculum-produced and employer-desired skills. The chef/cook curriculum provided for learning experiences appropriate for each employer-desired

skill. Although the Battelle staff members did not administer performance tests to the students to measure their performance relative to employer-desired skills, there was ample evidence of instructors' utilizing appropriate evaluation measures.

Whereas the employers indicated many skill discrepancies at the entry level, the analysis of the Battelle High chef/cook program curriculum-produced skills did not reveal skill discrepancies.

### General Recommendations

To facilitate school districts' efforts to adapt a system for making curricula more responsive to employers' skill requirements, the Battelle study made numerous recommendations. Some are implied in the preceding description of the method for curriculum development, but are included here to present a comprehensive picture of the various steps to implementation. From this list, school officials may select those which are appropriate to their particular circumstances.

### Training Advisory Committee

A training advisory committee should include employers or practitioners in the occupational area, union representatives, equipment manufacturers (where appropriate), teachers in the area, and representatives from the Employment Service.

A training advisory committee should participate in providing advisory assistance for:

- Curriculum design—including the selection of course objectives; selection of instructional materials; and selection of physical facilities, equipment and supplies.
- Recruitment of teachers for the training program.
- Selection of students.
- Placement of students in cooperative training situations.
- Evaluation of the program and of the students from direct feedback from employer/practitioners, observing in the schools, and talking with the students.

### Curriculum Development & Updating

Determine state requirements where appropriate.

Specify course goals—the major goal should be to train the student to perform in accordance with employers' entry-level skill requirements.

Develop detailed instructional objectives in behavioral terms for each of the major employer-desired tasks.

While emphasizing the tasks which are desired for entry by employers in the occupation, also develop instructional objectives for training in other tasks which will facilitate the later movement of the more capable students into higher-level jobs.

Design the instructional program so that it provides all students not only with a variety of general experiences in the area, but also with an opportunity for later specialization, dependent upon the interests of the student and on the needs of the locality in which the school is situated or in which the student hopes to find employment.

Establish broad limits within which each student is permitted to progress at his own pace.

Incorporate self instructional materials and individualized instruction in the curriculum to meet the needs of students who desire instruction in specific areas.

Emphasize interaction with related courses (e.g., construction trades) whenever feasible, especially for areas in which the basic skills are essentially the same.

Determine number of hours in the classroom vs. on-the-job.

Specify minimal clock hours of instruction. The instructor could be used more effectively if his responsibility is limited to specialized instruction related to the technical aspects of the occupation.

Provide both terminal and non-terminal programs.

Develop a detailed course guide for the subject area. This guide should be developed around the instructional objectives.

### Staff

Employ a program director.

Employ a *special* coordinator to supervise students assigned for on-the-job experience and act as a liaison between the school and the employer. He should be allowed ample time to learn the current procedures followed and skills required in the occupation, so that he may update curricula and instruction.

Recruit teachers trained in the use of new equipment, new materials, or new processes which are coming into the occupation, or provide for the retraining of a number of presently employed teachers.

A teacher/coordinator should have worked at least one year in the occupational area.

### Facilities and Equipment

Obtain preliminary data concerning the adequacy of existing school facilities and the availability of financial resources to improve school facilities.

Provide the training facilities, equipment, and supplies necessary to teach the subject area including new course content, by obtaining (where possible) up-to-date equipment of the type used in the work situation and by utilizing materials for instructional purposes which are identical to the materials used in the work situation.

Expose students to variations in equipment, methods, and supplies.

Modernize available school facilities where needed. Plans for securing stockroom facilities should be included in the modernization of facilities.

Wherever possible, utilize the facilities and instructors of training programs being conducted by employers in an occupational area.

### On-the-Job Training

Provide for adequate on-the-job experience for the students through school lab periods and cooperative training.

The co-op program should consist of work in various size operations (i.e., large companies, small companies).

Permit the student to be on the job for full days rather than for half days.

The employer should be given, in advance, a list of tasks which a student should have an opportunity to perform while in his employment. Some tasks will require that the employer provide training in the skills necessary to perform them; others will require that the employer merely provide an opportunity for the student to employ previously learned skills.

Provide very careful supervision for on-the-job experiences to make certain

the student is getting the variety of experiences he requires to meet the program objectives.

Provide the teacher/coordinator with at least 10 hours of coordination time per week for every 20 co-op students.

Where possible, provide trained student manpower in the occupational area for the school and other schools in the school district. Use the profits from any vocational education program (e.g., as in constructing a house as part of the building trades program and selling it), to provide scholarships and to further the program.

**Student Selection**

Expose prospective students to the opportunities in and benefits of the occupation.

Determine student selection criteria. Selection of students should be based on specific criteria regarding intellectual ability, maturity, and personal qualities.

Utilize a screening mechanism early in the high school years to identify students who have an aptitude for and an interest in the occupational area.

**Student Evaluation**

The employer must be given definite criteria by which to evaluate a co-op student. The evaluation form should be sent to the employer before the end of the co-op period. Evaluation should never be done by telephone or by unstructured rating sheets, because these techniques generally result in off-the-cuff impressions rather than a true evaluation of a student's performance.

Base evaluation of the training program on the stated program objectives.

Participate in the testing programs conducted by civil service agencies. The results of the examinations would provide information concerning the performance of students and would enable comparison of their performance with that of students in other schools.

Evaluate the students on important affective and motivational worker characteristics, such as the ability to work on one's own and the ability to work with others.

Consider implementing an individualized diagnostic program for those students who could benefit from such a program.

Base evaluation and promotion of students solely on performance, rather than on the number of years of training in the area.

Follow-up on graduates of the program to determine the number of students that actually enter the work area in which they were trained, to determine their levels of entry and to determine their rates of advancement within their work areas.

The work experience of students should provide an opportunity for the teacher to assess the strengths and weaknesses of the program. In the role of teacher/coordinator, the teacher's contacts with employers will give direct feedback.

**Placement of Graduates**

Improve communication with local employers by showing them how the students are developing their skills in an actual work situation.

Attempt to make arrangements with the appropriate union whereby students will be given apprenticeship credit for successfully completing the school's vocational program.

Provide job placement service to graduating students.

**Specific Recommendations for Seven Occupations**

The following summarizes some of the specific recommendations made for seven of the occupations studied. While they may have limited applicability in other school districts and training situations, those which touch on critical elements of the training for particular occupations may be useful.

**Distributive Education**

Place maximum emphasis upon providing students with extensive experience in oral communication since the *ability to communicate with the customer* is the skill most frequently and most highly desired by employers. Such experiences should be provided primarily by student participation in a distributive education co-op program and secondarily by enactment in classroom situations.

Ground rules for the co-op program should be established and fully understood in advance by co-op student, participating employer, and teacher-coordinator.

Provide the teacher-coordinator with at least 10 hours of coordination time per week for every 20 co-op students.

Contact the local Retailers Association and seek their assistance in organizing regional advisory committees.

**Typing and Stenography**

Provide shorthand laboratories in the business education program. The use of dictation records and tapes usually increases the rate at which a student takes dictation.

Equip typing rooms with at least 50 percent electric typewriters.

Appoint a committee of business education teachers to make a continual evaluation of curriculum design; course objectives; and physical facilities, equipment, and supplies. Subsequently, the committee would be responsible for recommending needed changes in any of these areas.

**Licensed Practical Nurses**

Organize the program:

- Employ a nurse-director meeting the requirements of the state board of nursing and the state department of education.
- The employment of a nurse-coordinator to supervise students assigned for clinical practice and act as a liaison person between the school and the clinical agency should be considered.
- The National Testing Service has developed a pre-admission test for licensed practical nursing, and this test, or others, might be considered as a screening device.
- Basic curriculum areas are prescribed by state licensing requirements. In addition, it is recommended that precise instructional objectives be specified for each of the major employer-desired tasks.
- Because of the nature of the learning experience required for the occupation, it is recommended that 40 percent of the instruction be in the classroom setting and 60 percent in clinical experience for a minimum of 1,400 clock hours total.

Provide clinical experience for students in the following areas: the care of medical-surgical patients, pediatric,

obstetric, and new-born; also, if possible, geriatrics (medical), psychiatrics, dietary, operating and recovery rooms, and emergency rooms.

**Dental Assistant**

*Specify minimal clock hours of instruction.* A schedule of less than 10 hours a week for the program appears to be insufficient for students to learn, even minimally, all the major functions of dental assisting. The instructor could be used more effectively if her responsibility is limited to specialized instruction related to the technical aspects of the occupation. Those aspects of the occupation which have general application, such as office management and public relations skills, could be integrated into related courses which the student could take.

**Auto Engine Mechanic**

Model cooperative programs after one in which the participating firms represent an excellent cross section of low- to high-level maintenance operations, thus allowing the coordinator to rotate the students for maximum exposure.

**Carpentry**

Emphasize interaction with other construction trades whenever possible, especially for areas in which the basic skills are essentially the same.

Utilize full-sized materials to build full-sized structures in shop operations whenever possible (rather than scaled-down models of larger structures).

Design the carpentry program so that it provides all students not only with a variety of general experience but also with an opportunity for later specialization, dependent upon the interests of the student and on the needs of the locality in which the school is situated or in which the student hopes to find employment.

Do commercial construction work, both new and renovation, for the elementary schools in the district.

Evaluate the students on important worker characteristics, such as ability to work on one's own and ability to work with others.

Emphasize the tasks desired by employers, but do not overlook training in tasks such as blueprint reading, estimating, knowledge of state and local building codes, and FHA regulations, all of which will facilitate the later movement of the more capable students into such jobs as foreman, construction superintendent, or contractor.

**Chef/Cook**

Combine theory and practical experience in cooking with related courses in English, speech, food cost analysis and control, business match, business management, economics, accounting, food purchasing, and human relations.

The terminal program would allow the student to enter the commercial foods industry as a trained cook with background for advancement in this area. The non-terminal program would be oriented toward a college program in food service management.

*Copies of the Battelle study are available from the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia, 22151.*

| Content Outline | Activities-Resources |
|---|---|

**Goal 4.2: Use a Variety of Sources of Employment Statistics that Directly Affect the Planning of Vocational Education Programs.**

A. Gathering Manpower Information

1. When trying to determine the manpower needs and supply of any selected occupation, geographical area, or population, you will want to obtain information firsthand from local employers, employment agencies, and students. However, local supply and demand information is not always accurate or adequate for planning vocational courses. Local data should be supplemented by national and regional information which can be used as a basis of comparison with local data.
2. Before you can systematically collect the necessary data, you need to know the source of the data, its reliability, and how you can use it. Useful sources of data include the following:

   a. Occupational Outlook Handbook, Bureau of Labor Statistics, U.S. Department of Labor--The Occupational Outlook Handbook contains a comprehensive survey of all job areas and is one of the most frequently used references for obtaining forecasting information. The handbook continues a tradition of providing highly useful service to anyone concerned with career planning. While

the handbook attempts to explain the changing nature of the labor market, it also tends to take a somewhat optimistic view of the future and tends to overstate the services of the U.S. Employment Service. The Outlook is published every two years.

b. The "Occupational Outlook Quarterly," Bureau of Labor Statistics, U.S. Department of Labor--The "Occupational Outlook Quarterly" is used to update the reports of the Occupational Outlook Handbook. This magazine contains employment information of major interest and relevance to those who advise students about the job market.

c. Tommorow's Manpower Needs, Bureau of Labor Statistics, U.S. Department of Labor--This publication projects the ratio of trained manpower to total employment; this projection is based on demographic information. In some cases, assumptions about likely shifts in the relative importance of different industry groups are applied to the projections. Data is provided that can be used to make both state and local projections.

d. The National Planning Association has projected the average annual openings on the basis of national goals. This association uses a technique, based on unfilled job openings, which utilizes the ratio of hard-to-fill jobs (unfilled for 30 days or more) to the total unfilled jobs over a period of

time, thus projecting future average annual job openings. The linking of current and past occupational shortages to the Bureau of Labor Statistics' national outlook for these same occupations is a final step in this method of projecting manpower needs (2).

(2) Planning, Implementing, and Evaluating Career Preparation Programs.

e. Manpower Report of the President, U.S. Department of Labor--The report is a yearly publication reporting on manpower requirements, resources, utilization, and training. The publication contains sections on:

(1) the Employment Record, which is a review of employment developments and their economic background, patterns of employment growth, unemployment and underdevelopment, and a look to the future for manpower requirements;

(2) Manpower Policy and Programs, which reviews the many different training programs;

(3) Manpower Research and Experimentation, which reviews the different manpower requirements and resources, supply and demand, and the scope of research taking place. This report is a good publication for showing the big labor picture nationally and for showing trends and projections of the different segments of the labor force.

f. Vocational and Technical Education, U.S. Office of Education--This yearly publication

presents the latest national data available on graduates, enrollments, and expenditures in federally reimbursed vocational and technical education programs. This forecasting technique should be employed in order to determine the probable number of graduates of federally reimbursed programs who will probably be available for jobs in each of the different vocational service areas.

g. Comprehensive Area Manpower Planning (CAMPS)--Some areas of the country are now establishing multi-agency manpower planning committees to assess area needs and priorities. It is suggested that the local office of State Employment Security or the State Department of Labor be contacted for details.

h. Meeting Tomorrow's Manpower Needs, Bureau of Labor Statistics, U.S. Department of Labor--This report provides data on national occupational employment projections and is designed for use by state and local planners. The publication contains a variety of forms and methods which can be used to scale down the national data to more closely match local employment conditions.

i. Dictionary of Occupational Titles, Bureau of Labor Statistics, U.S. Department of Labor--This publication provides information on the employment outlook over the next ten years in addition to providing job

descriptions, sources of employment, estimated earnings, working conditions, training, and other qualifications needed for each occupation listed in the directory.

j. State Employment Services can provide information on manpower trends. The information on unfilled jobs, etc. from these agencies can be compared with data from the Bureau of Labor Statistics to predict local job openings and trends. Also, state employment agencies occasionally conduct surveys of employers, the data of which would be very useful for making local projections (2).

(2) Planning, Implementing, and Evaluating Career Preparation Programs.

B. Professional Journals

Professional journals are also useful for keeping abreast of manpower needs, technological changes, and manpower interests. The following journals are useful for vocational educators:

American Vocational Journal
The Agricultural Education Magazine
The Junior College Journal
Training in Business and Industry
Business Week
Accounting Digest
Advertising Age
Changing Times
Computer and Automation
Consumer Report
Data Processor
Dunn's Review of Modern Industry

The Office
Nation's Business
Sales Management
Fortune
Journal of Marketing
Journal of Retailing
Marketing and Communication
Taxation for Accountants
Journal of Business
Industrial Arts and Vocational Education Journal
American Journal of Nursing
Nursing Outlook
Nursing Research
Nursing Education
R N
School Shop
Comprehensive-Community College Bulletin (2).*

(2) Planning, Implementing, and Evaluating Career Preparation Programs.

* See Classroom Activity 1 and Discussion Question C in Part III.

C. Study Activities

*Based on your reading of the content outline and any additional references as suggested, complete the following activities.*

Gathering Manpower Information. When conducting surveys to determine the manpower needs and supply of any selected occupation, you will need to obtain information firsthand from local employers, employment agencies, and students. However, local supply and demand information is not always accurate nor is it adequate for planning vocational courses. Local data should be supplemented by national and regional information which can be used as a basis of comparison with local data.

Before you can systematically collect the necessary data, you need to know the source of the data and how you can use it. Several sources of data are briefly described here.

Gathering Manpower Information Via Techniques Other Than Surveys (2). In order to obtain local, state, and federal manpower information, major forecasts and reports should be reviewed. The major sources of forecasts and reports are summarized below.

a. Occupational Outlook Handbook, Bureau of Labor Statistics, U.S. Department of Labor--The Occupational Outlook Handbook contains a comprehensive survey of all job areas and is one of the most frequently used references for obtaining forecasting information. The handbook continues a tradition of providing highly useful service to anyone concerned with career planning. While the handbook attempts to explain the changing nature of the labor market, it also tends to take a somewhat optimistic view of the future and tends to overstate the services of the U.S. Employment Service. The Outlook is published every two years.
b. The "Occupational Outlook Quarterly," Bureau of Labor Statistics, U.S. Department of Labor--The "Occupational Outlook Quarterly" is used to update the reports of the Occupational Outlook Handbook.

This magazine contains employment information of major interest and relevance to those who advise students about the job market.

c. Tomorrow's Manpower Needs, Bureau of Labor Statistics, U.S. Department of Labor--This publication projects the ratio of trained manpower to total employment; this projection is based on demographic information. In some cases, assumptions about likely shifts in the relative importance of different industry groups are applied to the projections. Data is provided that can be used to make both state and local projections. (NOTE: Some limitations to using this method are its lack of consideration for such factors as total job vacancies, wage data, and labor composition by occupation.)

d. The National Planning Association has projected the average annual openings on the basis of national goals. This association uses a technique, based on unfilled job openings, which utilizes the ratio of hard-to-fill jobs (unfilled for 30 days or more) to the total unfilled jobs over a period of time, thus projecting future average annual job openings. The linking of current and past occupational shortages to the Bureau of Labor Statistics' national outlook for these same occupations is a final step in this method of projecting manpower needs. (NOTE: Principal limitations to this method of data collection analysis are lack of information from employers and exclusion of wage and salary information.)

e. Manpower Report of the President, U.S. Department of Labor--The report is a yearly publication reporting on manpower requirements, resources, utilization, and training. The publication contains sections on:

(1) The Employment Record, which is a review of employment developments and their economic background, patterns of employment growth, unemployment and underdevelopment, and a look to the future for manpower requirements;

(2) Manpower Policy and Programs, which reviews the many different training programs;

(3) Manpower Research and Experimentation, which reviews the different manpower requirements and resources, supply and demand, and the scope of research taking place. This report is a good

publication for showing the big labor picture nationally and for showing trends and projections of the different segments of the labor force.

f. Vocational and Technical Education, U.S. Office of Education--This yearly publication presents the latest national data available on graduates, enrollments, and expenditures in federally reimbursed vocational and technical education programs. This forecasting technique should be employed in order to determine the probable number of graduates of federally reimbursed programs who will probably be available for jobs in each of the different vocational service areas.

g. Comprehensive Area Manpower Planning (CAMPS)--Some areas of the country are now establishing multi-agency manpower planning committees to assess area needs and priorities. It is suggested that the local office of State Employment Security or the State Department of Labor be contacted for details.

h. Meeting Tomorrow's Manpower Needs, Bureau of Labor Statistics, U.S. Department of Labor--This report provides data on national occupational employment projections and is designed for use by state and local planners. The publication contains a variety of forms and methods which can be used to scale down the national data to more closely match local employment conditions.

i. Dictionary of Occupational Titles, Bureau of Labor Statistics, U.S. Department of Labor--This publication provides information on the employment outlook over the next ten years in addition to providing job descriptions, sources of employment, estimated earnings, working conditions, training, and other qualifications needed for each occupation listed in the directory.

j. State Employment Services can provide information on manpower trends. The information on unfilled jobs, etc. from these agencies can be compared with data from the Bureau of Labor Statistics to predict local job openings and trends. Also, state employment agencies occasionally conduct surveys of employers, the data of which would be very useful for making local projections.

Professional Journals. Another source of manpower data is professional journals. Professional journals, such as those listed below, can provide information concerning the development of new programs or modifications of existing programs.

American Vocational Journal
The Agricultural Education Magazine
The Junior College Journal
Training in Business and Industry
Business Week
Accounting Digest
Advertising Age
Changing Times
Computer and Automation
Consumer Report
Data Processor
Dunn's Review of Modern Industry
The Office
Nation's Business
Sales Management
Fortune
Journal of Marketing
Journal of Retailing
Marketing and Communication
Taxation for Accountants
Journal of Business
Industrial Arts and Vocational Education Journal
American Journal of Nursing
Nursing Outlook
Nursing Research
Nursing Education
R N
School Shop
Comprehensive-Community College Bulletin

Press, Government, and Private Listings of Employment Opportunities. A valuable source of information for identifying new program areas is the employment want ads in newspapers and listings by various public and private employment agencies. Obtaining and monitoring these publicized listings over a period of time can show employment trends by pointing to areas of high employment demand and low supply.

Sources of employment information you may wish to survey include the following:

1. newspaper(s) in your area with the most comprehensive listing of job vacancies;
2. public employment offices in your immediate area;
3. major private employment agencies within your area;
4. Federal and State Civil Service, U.S. Department of Labor, and State Employment Service;
5. School placement services that tally job openings;
6. Major employers in your area that regularly publish lists for circulation of vacancies they wish to fill.

1. An important aspect of conducting manpower surveys is keeping information current. Out-of-date data is misleading and useless for planning effective curricula. In order to be sure that data is current, you should have a system for obtaining and analyzing professional literature and reports on a continuing basis. The following activities will help you "keep current."

   a. List five professional journals that would be useful in your specialized area of vocational education.

   b. List as many community groups and agencies as possible in your geographic area that can provide you with information regarding vocational education in general and your area of interest in particular.

   (Note: If you are unable to locate community groups or agencies, discuss this problem with your instructor. He may be able to help you locate such groups.)

2. List resource materials and references that could be useful for your vocational area of specialization under each of the following categories of data collection.

SOURCES OF EMPLOYMENT AND JOB MARKET DATA

| |
|---|
| Local Data |
| Regional Data |
| State Data |
| National Data |

3. Obtain the two required references and at least three of the selected references from the list below. Try to find one reference that covers local or regional data and one that covers state or national data. Your instructor may also suggest other references you may use instead. After you have selected the references, pick a vocational occupation and using that occupation as the basis for your research, complete the chart that begins on the next page.

Required References

1. Manpower Report of the President, U.S. Department of Labor
2. Dictionary of Occupational Titles, Bureau of Labor Statistics

Selected References

1. Occupational Outlook Handbook, Bureau of Labor Statistics
2. The "Occupational Outlook Quarterly," Bureau of Labor Statistics
3. Tomorrow's Manpower Needs, Bureau of Labor Statistics
4. Reports from The National Planning Association, Bureau of Labor Statistics
5. Vocational and Technical Education, U.S. Office of Education
6. Reports from the Comprehensive Area Manpower Planning (CAMPS), State Department of Labor or State Employment
7. Meeting Tomorrow's Manpower Needs, Bureau of Labor Statistics

## CHART FOR IDENTIFYING AND UTILIZING DATA

| QUESTIONS: Answer each question below for each of the five sources. | Manpower Report of the President | Dictionary of Occupational Titles | Local Source _____ | State Source _____ | National Source _____ |
|---|---|---|---|---|---|
| 1. Does the source identify the numbers of persons employed by the occupation? | | | | | |
| 2. Does the source identify the growing and expanding occupations that are related to each other? | | | | | |
| 3. Does the source identify the related occupations in which the demand is diminishing? | | | | | |
| 4. Does the source identify the stability of the occupation based on average annual man-hours worked (steady employment throughout the year)? | | | | | |
| 5. Does the source project the need for this occupation five or ten years from now? | | | | | |

## CHART FOR IDENTIFYING AND UTILIZING DATA

| QUESTION: Answer each question below for each of the five sources. | Manpower Report of the President | Dictionary of Occupational Titles | Local Source _____ _____ | State Source _____ _____ | National Source _____ _____ |
|---|---|---|---|---|---|
| 6. Does the source identify information about wages? | | | | | |
| 7. Does the source identify regulations regarding licensing, certification, and registration? | | | | | |
| 8. Does the source identify the levels of education required for job entry and job advancement? | | | | | |
| 9. Does the source identify the tasks that make up the occupation? | | | | | |
| 10. Does the source list the probable employers? | | | | | |
| 11. Does the source describe related occupations that can be entered? | | | | | |

4. Referring to the "Chart For Identifying And Utilizing Data" that you just completed for Exercise 3, answer the questions below. These questions involve an analysis of the advantages and disadvantages of the manpower information sources.

   a. Which references give the most detailed information regarding the number of people needed for the occupation you selected?
   b. Which references give the most detailed information regarding wages?
   c. Which references give the most detailed information regarding the tasks that are involved in the occupation?
   d. Which references give the most detailed information regarding educational requirements and licensing requirements?
   e. Which reference could be used to summarize or develop job clusters?
   f. Which reference could be used to summarize or specify career ladders?
   g. Briefly describe the contents and how you would use each of the references below.
      a. Manpower Report of the President
      b. Dictionary of Occupational Titles
      c. Local Source _____ (Title)
      d. State Source _____ (Title)
      e. National Source _____ (Title)

| Content Outline | Activities-Resources |
|---|---|

Goal 4.3: Explain the Purposes of and Techniques for Conducting Manpower Needs Analyses.

A. Four Types of Analyses Used in Manpower Forecasting

There are four basic types of analysis commonly used in manpower forecasting. They are:

1. employer surveys,
2. econometric techniques,
3. job vacancy-occupational outlook surveys,
4. extrapolation of trends (12).

(12) Vocational Education Planning: Manpower, Priorities, and Dollars, p. 25.

A fifth type of analysis, literature surveys, is the basis for almost all studies to determine manpower needs.

B. Employer Surveys

1. An employer survey is sometimes referred to as a training needs survey or an area skills survey. Regardless of the specific term, it is simply a technique for determining local-regional manpower needs and opportunities. The survey, correctly done, will identify from 50 to 150 occupations that employ a relatively large number of persons in the area.
2. After identification of occupations, a follow-up survey of employers is conducted to determine their current manpower needs in these

occupations and their expected needs two years and five years in the future.

3. The employer survey is the approach most used by vocational administrators since it is relatively easy to administer, is inexpensive, and is quickly implemented.
4. The reliability and validity of employer responses may be questionable, however, since many firms do not do the planning necessary to project their own needs with any degree of accuracy.
5. One often overlooked advantage of the employer survey is the resulting involvement of local employers in curriculum planning. The employer can have his ideas and preferences incorporated into the vocational curriculum plans (12).

(12) Vocational Education Planning: Manpower, Priorities, and Dollars.

C. Econometric Studies

1. Econometric studies are more sophisticated and dependable than employer surveys, but for the most part they are too complicated, time-consuming, and expensive for the typical vocational education curriculum developer to conduct. However, other agencies do make econometric studies and the results of such studies can be invaluable and should be used by all vocational curriculum developers.
2. Econometric studies are conducted by the Bureau of Labor Statistics (BLS) of the U.S. Department of Labor. The BLS econometric approach yields a national ten-year demand analysis based on

projections of population, labor force, productivity, consumption, and overall output that provides estimates of new openings by occupation. These estimates can be obtained from the U.S. Department of Labor.

3. There are disadvantages, or at least limitations, with this technique also. Accuracy is a problem since it is hard to forecast economic activity, technological change related to productivity, and specific needs, which change due to labor and capital mobility, in given market areas. Also, the statistics are national and may not be entirely useful for local or regional planning.
4. Many have suggested that the BLS model for econometric studies be adopted by state and regional planning departments. Although to be valid and useful it requires extensive knowledge of labor economics and statistics, the implementation of the model would be useful in providing local data regarding manpower needs (12).

(12) Vocational Education Planning: Manpower, Priorities, and Dollars.

D. Job Vacancy Studies

1. The job vacancy approach modifies the econometric model by adding local input to it. It combines data from the BLS with an analysis of the local employment listings of unfilled job openings. Jobs unfilled for 30 days are compared with national trends and analyzed in terms of different characteristics. This analysis results in a priority listing of jobs with apparent shortages of workers, which the

educator must then analyze in terms of probable persistence of the shortage, trainability of potential job holders and the cost benefit return of training workers for the job.

2. The job vacancy approach is relatively inexpensive; it can be programmed on a local-regional basis, results in an up-to-date record of trends, and can be implemented by the local vocational educator.
3. The disadvantages are apparent. It deals with present needs and not necessarily with either long-term or future needs of the community or the interests of students. It is also static--it does not predict the future growth of present or new industries.
4. However, job vacancy studies cannot be ignored and should be conducted by all vocational curriculum planners (12).

(12) Vocational Education Planning: Manpower, Priorities, and Dollars.

E. Extrapolation of Trends Surveys

1. Another approach to manpower forecasting is that of extrapolation. This technique attempts to forecast future needs on the basis of past trends. It may be done on a local-regional, statewide, or national basis.
2. The advantage of this type of survey is that extrapolation is relatively quick, easy, and inexpensive.
3. The disadvantages of the technique are critical and limit its value. With the explosion in technological knowledge and the rapid changes in production patterns and occupational

requirements, the predictive validity of extrapolation becomes more questionable the further it is extended into the future.

4. This process (looking at past trends to predict future needs) is best used only as a starting place. Consider past manpower needs, for example, as merely a way of selecting those industries you will survey or study to determine future manpower needs. But don't expect past manpower needs to be repeated either in quantity or in type of skill and occupation required. The only situation in which the extrapolation of past trends can be useful is in short-term predictions (12).

(12) Vocational Education Planning: Manpower, Priorities, and Dollars.

F. Literature Surveys

1. Literature surveys are the backbone and basis for almost all studies to determine manpower needs. A wealth of information is reported in newspapers and professional journals: the needs of industries, new developments in technology, new and different equipment, new offices of national companies, and industry expansions and reductions.
2. Vocational educators should have subscriptions to local and national papers and journals, and more importantly, should set aside the time to read them regularly (12).*

(12) Vocational Education Planning: Manpower, Priorities, and Dollars.

* See Discussion Question D in Part III.

G. Summary of Manpower Forecasting Techniques

1. To summarize, the best manpower approach is one that utilizes elements from all of the approaches presented.

2. The problem usually lies in determining how much effort and money a school or school district can afford to put into manpower forecasting. Although it may be hard to defend the time and expense required to conduct an in-depth, costly study, there should be no trouble justifying a sensible, ongoing, consistent program of predicting manpower needs and opportunities. The program ideally should predict regional as well as local needs.
3. Manpower forecasting related to curriculum planning is obviously a continuing process and cannot be limited to a one-time "snapshot" of the local labor market.

H. Critical Requirements for a Manpower Forecasting Model (4)

(4) Review and Synthesis of Research on Manpower Forecasting for Vocational-Technical Education, p. 5.

1. David Kidder in Review and Synthesis of Research on Manpower Forecasting For Vocational-Technical Education lists six critical requirements for a manpower forecasting model that can be used by vocational educators:

   a. The technique should be replicable at different times and in different places. This requirement concerns costs as well as technical complexity of the model.
   b. All assumptions of the model should be reasonable, and should be explicitly and clearly stated.

c. The structure of the model should be thoroughly explained, in language understandable to potential users of the model.

d. Forecasted estimates of errors should be included.

e. Forecasted subtotals should be internally consistent, and should be cross-checked to prove consistency.

f. Accuracy analysis should be an integral part of the forecasting process.*

* See Classroom Activity 2 and Discussion Question E in Part III.

## I. Study Activities

*Based on your reading of the content outline and any additional references as suggested, complete the following activities.*

### Employer Surveys

There are three general ways by which you can identify manpower needs. The first and most common is to conduct employer surveys; the second is to study the literature to locate manpower needs, business changes, technological changes, and so on; and the third is to review economic and labor studies conducted by the state and the federal government.

The method you select will depend on your objectives and your situation (constraints of time, money, and resources under which you work). Usually, however, you will use a combination of the three methods. Because conducting employer surveys is the most common method to identify manpower needs, it is discussed here.

One of the major inputs into selecting and justifying vocational programs is information about the labor market, including manpower supply and demand. Manpower supply information provides an indication of the number of individuals available in the labor market with a particular skill. Manpower demand information indicates the number of individuals with a particular skill that are needed in the labor market.

The comparison of manpower suppy and demand information identifies jobs for which there is not an adequate source of trained manpower. This comparison answers the following questions:

1. What vocational programs may be needed in a given geographical area?
2. What vocational programs may no longer be needed in a given geographical area?

You will find the following steps useful when conducting an employer survey to determine manpower needs.

1. Identify a group or committee to assist in planning and executing a manpower survey--preferably one that has an interest in and use for the survey results. The following are possible groups (or combinations of groups) you may wish to involve:
   a. a committee of vocational education leaders (directors, department chairpersons, etc.) from all of the schools in the area or region to be surveyed;
   b. a committee composed of representatives from each of your ongoing specialized advisory committees;
   c. a general advisory committee with broad representation from all segments of the community--both labor and management.

The individuals you select as members of the committee should be knowledgeable about the community's businesses, industries, and agencies.

2. Meet with the committee you select to establish a plan for completing the manpower needs survey.

3. Select a director who has the time and background to administer the study and write the final report.

4. Discuss with the committee the assignment of tasks to individuals or subcommittees and discuss projected deadline dates.

5. Outline on a map the region or geographic area within which your comprehensive survey will be conducted.

6. Prepare a listing of the businesses, industries, and agencies within the geographic area. This list should include both manpower users and suppliers of trained personnel. Obviously, some organizations will fall into both categories. For example, a business having a formal training program for a given job classification would be both

a supplier of manpower and a user of the same.

In completing this step, your committee can be of great assistance. In addition, the following documents may be consulted:

a. yellow pages of the telephone directories in the geographic area to be surveyed;
b. directories of manufacturing associations, the Chamber of Commerce, etc.;
c. listing of organizations and agencies contacted by the United Crusade or United Fund.

7. Determine the technique(s) to be used for data gathering. The three techniques listed here are most popular:

   a. Personal interview;
   b. Mail survey;
   c. Telephone survey.

8. Develop a timetable for completing the survey.

9. Design the instrument(s) to be used to survey manpower users and suppliers in order to obtain local manpower supply and demand information.

10. Have your committee review the instrument or instruments prepared. Committee members will often have valuable suggestions for improving instruments in order to ensure proper interpretation of questions.

11. If data processing services can be obtained for tabulating the survey responses, the instrument(s) should be reviewed with data processing personnel prior to finalizing it. This will ensure proper coding of the items for key punching.

12. Finalize the survey instrument(s) you intend to use.

13. A small sample of organizations and agencies should be selected for pretesting the instruments and for providing experience to the data collectors, if necessary. On the pretest ask the respondents to indicate if any questions are unclear or if it is difficult to answer any questions.

14. Analyze the pretest data to determine whether the instrument(s) is (are) obtaining valid and reliable data.

15. Revise the instruments, if necessary, on the basis of pretest results.

16. Conduct the survey using one of the following methods:

    a. Personal Interview Method

       Conduct an orientation for interviewers who will be making the visitations. Written procedures will need to be prepared and used by all data collectors to ensure reliable and valid responses.

    b. Mail Survey Method

       If a mail survey is to be used, a cover letter on letterhead stationery should be sent along with the survey to the different businesses. The letter should be co-signed by the director of vocational programs and perhaps by the chairperson of your committee. Enclose a self-addressed, stamped envelope with the survey.

    c. Telephone Survey Method

       The telephone survey may be used for obtaining limited information for a specific occupational area. This method is very limited in use and is not usually appropriate for a comprehensive survey.

17. Analyze and report the data to the survey committee. In analyzing

and reporting the data, the following should be done:

a. Describe the procedures used in completing the survey, including:
   (1) committees utilized;
   (2) sample surveyed;
   (3) survey technique used;
   (4) why the survey was conducted.

b. Describe the findings of the report, including:
   (1) the number of concerns surveyed;
   (2) the number and percentage of returns or responses;
   (3) the number of usable and unusable returns;
   (4) the tabulation of responses to each question on the survey instrument. (Reporting responses in this manner allows the reader to see both the question and total of responses for each question.)

c. Consider the following points when analyzing the data and reporting the conclusions and implications of the study:
   (1) A rapid reversal in the need for trained personnel can occur with even minor changes in the level of the economy, particularly in technical fields supporting the production of consumer goods. In the human or personal services, there is less fluctuation in manpower needs when the overall level of the economy changes; thus, demands are more predictable. If there is a discrepancy between national and local data, and if you know that your local survey is valid, put your stock in the local survey.
   (2) Not all graduates who are trained are immediately available for placement in related jobs within the boundaries of the district. Many migrate to other districts or states, enter the Armed Forces, continue in school to further education, or completely withdraw from the labor force and do not accept employment. This last group of graduates is considered a short-run loss to the district; therefore, the number of projected graduates may somewhat exceed the demand.

(3) Certain people within a district migrate to obtain employment; this factor must also be considered in determining supply.

(4) Not all enrollees in a program complete the program and graduate. Those enrollees who fail to complete the training program and depart without graduating may or may not be used as a source of manpower supply; therefore, the number of enrollees required to satisfy the needs requirement is a matter of interpretation (2).

1. This activity requires you to complete several of the steps outlined in the procedure just described. Complete all the following steps as if you were going to conduct an employer survey to determine the manpower needs for a specific occupation or cluster of occupations in your local community.

Step 1 Identify a group or committee that you could use to assist you in planning and executing a manpower survey. Following are possible groups (or combinations of groups) that you may select to involve:

a. a committee of vocational education leaders (directors, department chairpersons, etc.) from all of the schools in the area or region to be surveyed;
b. a committee composed of representatives from each of your ongoing specialized advisory committees;
c. a general advisory committee with broad representation from all segments of the community (manpower users).

Step 2 Outline on a map the region or geographic area within which your study is to be conducted.

Step 3 Prepare a listing of the businesses, industries, and agencies within the geographic area that you would survey.

Step 4 Determine the techniques(s) that would be used for data gathering. The three most popular techniques are:

a. personal interview;
b. mail survey;
c. telephone survey.

Step 5 From the list of organizations and agencies, select those which you would include in your survey.

Step 6 Design the survey form to be used to survey manpower users and suppliers in order to obtain local manpower supply and demand information.

2a. Briefly describe how each of the following types of surveys to determine educational needs are conducted.

a. Employer surveys
b. Econometric studies
c. Job vacancy surveys
d. Trends surveys

b. Briefly explain why manpower needs assessment or manpower needs analysis is a crucial step in the development of educational materials.

| Content Outline | Activities-Resources |
|---|---|

Goal 4.4: Explain the Purpose of and the Techniques for Obtaining Manpower Supply Data.

A. Determining Manpower Supply Data (Population Needs and Interests)

1. One can think of vocational curriculum planning as an attempt to balance an equation. On one side of the equation is the manpower needs of business and industry in the community. On the other side is the demands and interests of the student being served. Somehow, on a continuing basis, each side of the equation should balance the other.
2. Most educators, however, agree that the needs of informed student populations should have priority in curriculum and program planning. (Included in the student population are adults to be retrained, veterans, and handicapped persons as well as high school and college students.) The problem, then, is to define consumer preferences and verify that consumer preferences are based on informed and realistic analysis and information.

B. Defining the Population

First, the population that makes up the vocational education consumer group must be defined. One of the primary consumers is the day student in high

school. That age group is relatively homogeneous. The adult and out-of-school group is more difficult to analyze. Community colleges can define their consumer population in terms of geography, but age span is another matter (11).

(11) Leadership in Administration of Vocational and Technical Education.

C. Determining Population Preferences

1. There are a number of different methods determining population preferences. One method, direct survey questionnaires, can reach large numbers of vocational students. These surveys can be conducted through high school classes, at public employment offices, at military release centers, or through the mail.
2. Education and vocational guidance counselors can provide reasonably valid feedback about student interest. Industrial employment offices may have an interest inventory based on the interests of the people who have applied for jobs--Veteran Administration Offices, Vocational Rehabilitation Offices, and State Employment Security Offices all have these (11).

D. Analyzing Population Preferences

1. Another problem is making sure that consumer preference is founded on an adequate knowledge of occupational options and career possibilities. For many occupations a fairly wide communications gap seems to exist regarding job skill

requirements and status, and, more importantly, availability of jobs and wage-income potential. In addition, to further complicate the possibility of informed consumer preference is the problem of determining what future possibilities will be like for a particular career. A rational choice about vocation must consider not only current employment opportunities, but also probable future developments in technology, supply and demand, income levels, requirements for retraining, and perhaps most importantly, the "ladder relationship" of the career choice. By ladder relationship we mean the opportunity through further education and/or experience to enter another career phase in the same general discipline or career field.

2. An important and continuing task of vocational educators, therefore, is the diffusion of information about vocations. Only with such information can consumers make rational decisions about vocational curriculum preferences (11).

(11) Leadership in Administration of Vocational and Technical Education.

E. Methods of Obtaining Manpower Supply Data

Vocational curriculum specialists should always be alert to suggestions regarding new and needed vocational programs. However, better and more reliable data regarding manpower interests and needs can be collected if a systematic program is adopted to do so. The following are some suggested methods for collecting manpower supply data:

1. Monitor phone requests and inquiries that come from students, parents, or adults interested in new fields of study. Be sure that the school telephone operator, as well as the counselors, know that you are interested in program requests or suggestions.
2. Follow up on student withdrawals and dropouts to determine why students are leaving the program. Many times students drop out of a program because they see no use for continuing in it. In such cases, an analysis should be performed of the program's goals and objectives, teaching plans, and the teacher in order to determine the causes for the lack of interest.
3. Follow up on graduates of vocational education programs to see what difficulties they have once they are employed. Ask them what skills they use and don't use, how they would revise the program, what other programs they would suggest, and which programs they find outdated.
4. Other methods for determining manpower supply data include the following:
   a. Obtain opinions from all students in the institution regarding the educational programs in which they are enrolled or would like to have available.
   b. Conduct an interest survey(s) of potential student group(s) or obtain the data via secondary sources.
   c. Obtain opinions and suggestions on programs from all institutional staff organizations, and special committees.

d. Establish a plan for scheduling and uniformly reporting staff visits and contacts with community groups, professional and other organizations, employers, etc.

e. Establish and conduct a meeting(s) of a general or specialized occupational advisory committee.

f. Obtain and analyze professional literature and published reports for program suggestions.

g. Obtain and analyze studies done by various community groups and agencies to obtain demographic, economic, and sociological data.

h. Monitor press, government, and private listings of employment opportunities (2).*

(2) Planning, Implementing, and Evaluating Career Preparation Programs.

* See Discussion Questions F, G, and H in Part III.

F. Wrapup of Module*

* See Classroom Activities 3 and 4 in Part III.

G. Study Activities

*Based on your reading of the content outline and any additional references as suggested, complete the following activities.*

Obtaining Manpower Supply Data (2)

There are two important steps in assessing the manpower supply and student or population interests and needs in vocational education. First, you must gather data and opinions that indicate student interests and needs on a local, regional, and national level. Secondly, you must analyze the opportunities that are already available to students through current public and private educational facilities. With these two categories of data, you can begin to make sound decisions for vocational curriculum.

With this in mind, read the following suggestions for monitoring and collecting requests for, and interest in, vocational education programs.

Determining Population Interests. Undoubtedly, like most other persons responsible for developing and maintaining the best educational service for your community, you share a concern for identifying the best ways possible to obtain suggestions for new programs as well as modifications in existing programs so that the population you serve is prepared for vocational experiences.

Activities you might consider to obtain manpower supply data include the following:

1. Monitoring phone requests and other program inquiries that are received by school offices from ongoing and potential students.
2. Gathering data and reporting on student withdrawals and dropouts. Reviewing or conducting a follow-up study of program graduates.

3. Obtaining opinions from all students in the institution regarding the educational programs in which they are enrolled or would like to have available.
4. Conducting an interest survey(s) of potential student group(s) or obtaining the data via secondary sources.
5. Obtaining opinions and suggestions on programs from all institutional staff, organizations, and special committees.
6. Establishing a plan for scheduling and uniformly reporting staff visits and contacts with community groups, professional and other organizations, employers, etc.
7. Establishing and conducting a meeting(s) of a general or specialized occupational advisory committee.
8. Obtaining and analyzing professional literature and published reports for program suggestions.
9. Obtaining and analyzing studies done by various community groups and agencies to obtain demographic, economic, and sociological data.
10. Monitoring press, government, and private listings of employment opportunities.

Monitoring Phone Requests and Inquiries. Program inquiries and requests from students, parents, businesses, industries, etc., serve as another indicator of community wants, interests, and needs regarding career preparation programs. Inquiries and requests can serve as possible indicators of the changing needs and interests of the people in the community and as a valuable source of ideas for possible new program areas or for modification of existing programs. Although such requests are not as valuable as state or national statistics that show an actual need for training, they should be considered as an additional source of information. Personnel in offices of the board of education, superintendent of schools, vocational director, admissions, counseling, community service, and placement, are in an excellent position to monitor such phone calls, inquiries, or suggestions.

To collect and record program inquiries, you might follow the procedure below:

1. Develop a form for recording inquiries and requests.
2. Distribute the request form and instructions to the supervisor of each institutional office (admissions, counseling, community service, placement, etc.) that receives calls and requests.
3. Instruct those who are to use the form on how and when to use it.
4. Periodically tabulate the results and prepare a report.

Follow-up Procedure on Withdrawals and Dropouts. Follow-up information on withdrawals and dropouts can be the most valuable source for obtaining possible new program suggestions or suggestions for changes in existing school programs. Not only should the early leaver be asked why he dropped out or withdrew from a career program or school, but he should also be asked whether he would have remained in the program or school had other program offerings been available to him. The opinions of the students withdrawing from school or dropping out of occupational programs can serve as a valuable source of information for possible program development or modification. Below is a procedure identifying the steps necessary in establishing withdrawal interviews and a dropout survey program.

Withdrawal Interview Procedure

1. Contact persons in your institution who will be in contact with students planning to withdraw or transfer to other programs.
2. Develop a "Withdrawal Data Form."

   Establish specific outcomes that you want from a "Withdrawal Data Form," or "Exit Form." Then, select or develop questions based on the outcomes. (When you select questions do not overlook the possibility that you could obtain some information from school records without asking students.) Eliminate the "nice-to-know" but non-essential items in order to keep the form as short as possible. And be sure to allow space for "other comments."
3. Compile and analyze withdrawal interview data at the end of each semester. Report the information to the appropriate staff members.

Dropout Survey Procedure

This procedure is designed to supplement the withdrawal interview procedure previously described. Since some students leave your institution without formally withdrawing, this drop-out survey used in conjunction with the withdrawal interviews can give you a more complete picture on why students leave your school.

1. Identify students who left your institution, but who are not listed as formally withdrawn. Obtain a mailing address on each. This information can usually be obtained from the admission or counseling offices. The sample would include all students not enrolling for the subsequent semester but not having formally withdrawn, graduated, or transferred. In addition, you may want to limit this to formally enrolled full-time students.
2. Develop a survey instrument and a cover letter to be mailed to all students being surveyed.
3. Carry out the survey. Obtaining replies from these persons is difficult; however, the responses received will add to the overall quality of your information on withdrawals.
4. Compile and analyze data. This step should be completed after you are satisfied that you have obtained the best response level possible. Compile and report data by responses per item on the instrument. Observe particularly the frequency of responses checked or the similarity of free responses.

Conduct a Follow-up Study of Program Graduates. Students who have completed programs can also be a valuable source of information for new program or program modification suggestions. These students are in a good position to assess the value of the program and the need for changes or additions.

The value of the suggestions will depend on whether the student is employed and whether he has taken a job in a related or unrelated occupational area. The students who are unemployed can provide useful data

as to why they are not employed. However, the most useful information pertaining to program additions or deletions will come from those persons employed in a job-related, occupational area.

Since the reactions of your graduates may change over a period of time as they gain more job experience, it is recommended that this activity be repeated completely one year after graduation and again after the third and fifth years.

The following procedure may prove useful:

1. Identify and define the sample to be surveyed. The sample should be stratified on the basis of the following:
   a. program graduated from
   b. year of graduation
2. Outline the key questions you want the students to answer. Key questions might include the following:
   a. What is their employment status?
   b. How many are employed in related and non-related jobs?
   c. What is their present salary?
   d. What is their evaluation of the school educational program which prepared them for the job?
   e. What is their evaluation of the school ancillary services?
   f. What recommendations can they make to improve the school program?
   g. What are their present educational goals?
3. Develop the survey instrument. This should be accomplished by developing survey items based on the desired outcomes and key questions outlined above.
4. Evaluate the survey instrument for:
   a. clarity--Is each item understood?
   b. ease of completion--Can it easily be completed?
   c. importance-- It is important that you include only the essential items related to your objectives. Eliminate the "nice-to-know" items from your instrument.

5. Develop a procedure for data gathering. You may use any of the following methods:
   a. personal interview
   b. mail survey
   c. telephone survey
6. Develop a letter to be sent to graduates being surveyed. The cover letter should be signed by someone known by the student, such as a teacher, department head, or counselor.

   The more that can be done by individual teachers and administrators to establish the value of follow-up data while a student is still in school, the more likely it is that a good response level will be obtained. In addition, the use of a student committee of presently enrolled students to assist with the survey will prove helpful.
7. Finalize plans for the mailing and return of survey forms. The plans should include:
   a. when the survey will be mailed
   b. when the thank-you reminder postcard will be mailed
   c. when the second cover letter will be mailed
   d. provisions for contacting non-respondents via personal interview or telephone

1a. Briefly describe the procedure you would follow to monitor phone requests received by the school office.

b. When should you conduct a follow-up study of program graduates?

_____a. immediately after they graduate

_____b. one year after graduation

_____c. three years after graduation

c. Briefly describe the procedure for gathering data on student withdrawals and dropouts.

d. Briefly describe the procedure you could carry out to conduct a follow-up study of program graduates.

e. Typically the response on a mail return (postcard) survey is around 30%. What are the problems and hazards regarding assumptions based on this percentage of return?

How to Conduct an Interest Survey (2)

An interest survey is a valuable means for identifying how educational institutions can best serve the different members of the community. This type of survey can yield important information pertaining to the physical characteristics, past education and employment, interest, motivation, and attitudes of members of the target group(s). When the interest of the potential manpower supply is compared to the manpower needs of local industry and business, important decisions can be made in vocational program planning.

One of the important target populations to be considered is the high school group. It is recommended that a systematic procedure be established whereby student interest information is gathered each year from entering high school sophomores and seniors. It is also very important that you survey the parents of the high school students being surveyed. (Identify the parents' judgments, feelings, aspirations, likes and dislikes, etc.) The reason for the parental survey is that some research studies point out that parental aspirations are the single most important influence on what a youngster chooses for an occupational career.

The major source groups for data relating to student demand for career preparation programs are: (1) parents, (2) high school faculty, and (3) the potential students including: (a) recent high school graduates, (b) employed workers, (c) unemployed, (d) underemployed, and (e) mobility bound people.

The procedure outlined on the following pages is intended to help you obtain data from high school students, parents, and other members of the community or from secondary sources.

1. Identify the sample to be surveyed. Some examples of groups that might be surveyed are:
   a. high school sophomores and seniors
   b. parents of the high school students
   c. minority groups
   d. unemployed persons
   e. handicapped persons

   To assist you in the identification of target groups other than high school students, you may want to consult with the general occupational advisory committee, the State Employment Service, Community Action Agency, organizations representing minority groups, etc.

2. Outline the expected outcomes of the survey and the tasks to be accomplished. This step should identify what information is needed and why it is needed.

3. Determine a method(s) of data collection:
   a. personal interview
   b. mail survey
   c. telephone survey
   d. other sources

   If you are going to collect data from the high school students and their parents, it is a good idea to have the local high schools administer, collect, and return the surveys to you.

4. Develop a timetable for data collection.

5. Appoint a committee to assist with the collection of data. A great deal of manpower may be required to complete this activity adequately.

6. Select the sample to be surveyed.

7. Design the cover letter and survey instruments. The following data might be collected:
   a. age
   b. sex
   c. present educational interests
   d. student aspirations
   e. types of course or program interests
   f. plans for high school, post-high school (college and occupational interests beyond high school)
   g. father's and mother's occupations
   h. parents' educational background
   i. parental aspirations and preferences for son's or daughter's education and/or career status
   j. parental and student opinion concerning career preparation programs
   k. parental career plans
   l. number interested in attending classes at high school, area vocational center, or junior college

   Consider, however, whether you want to ask personal information that may conflict with the invasion of privacy laws.

   Many student interest surveys are no more than interest inventories which ask students to check their career preference. When so instructed, many students select those that have the most appeal or glamour. There is not necessarily a commitment on the part of the student, and the data should be evaluated with this in mind.

8. Try out the survey instruments on a small group of high school students, their parents, and the occupational advisory committe to determine if the instruments are gathering the data for which they were prepared.

9. Analyze the data gathered in the pre-trial. If the instruments are gathering the intended data, they are ready for use; if not, revise those questions or surveys which need to be.

10. Conduct the survey.
    a. For a mail survey, develop a schedule for sending the survey and for sending the follow-up reminder letters.
    b. For personal interviews, you will need to develop a visitation schedule and will need to train the data collectors.
    c. If guidance counselors will be administering the survey for you, you will need to make arrangements with them for administering the survey and provide them with the necessary instructions.

11. Analyze and tabulate the results. To judge the validity and usefulness of the information gathered, factors such as the following should be considered:
    a. Consider the percentage of returns from a particular group, and the completeness of the information on the returns.
    b. Look carefully at the problem involved with offering the suggested program; i.e., transportation and finances of low-income groups, the educational background of the suggested group, the diversity of a group interested in a particular program, scheduling problems (day, evening, part-time, full-time), etc.
    c. Tabulate the total number of program requests including all groups surveyed.
    d. Calculate the types and extent of program requests made by specific groups that it may be considered most important to serve because of their being low income, unemployed, high school graduate, dropout, etc.

2. This activity requires you to select one specific target population (high school students, college students, veterans, or evening students) and carry out some of the steps involved in a manpower interest survey. Complete the following steps:

   Step 1 Identify the sample to be surveyed. Some examples of groups that might be surveyed are:
   a. high school sophomores and seniors;
   b. parents of the high school students;
   c. minority groups;
   d. unemployed persons.

   Step 2 List the questions you want to include in the survey.

   Step 3 Determine a method(s) of data collection:
   a. personal interview;
   b. mail survey;
   c. telephone survey;
   d. other sources.

Wrapup Activity

NOTE: To meet the basic requirements of this module, select one of the following activities and complete it as directed. If you wish to gain additional credit beyond the basic requirements, you may choose a second activity to complete. Consult with your instructor first if you wish additional credit.

1. Refer to Activity 1 for Goal 4.3 when completing this activity.

   The purpose of this activity is to give you the opportunity to complete most of the steps that are a part of a manpower needs analysis survey. You can continue on with the activity you selected for Activity 1 or select a new occupation or cluster of occupations.

a. Develop the following before conducting your survey:

   (1) question forms and necessary survey instruments
   (2) charts showing occupations
   (3) introductory letter requesting assistance
   (4) map showing geographic area to be surveyed
   (5) time schedule
   (6) advisory committee
   (7) plan for reporting results

b. Conduct a manpower survey using one of the following three strategies:

   (1) personal interview
   (2) mail survey
   (3) telephone survey

c. Analyze and report the data in a three- to five-page paper.

2. The purpose of this activity is to give you the opportunity to complete the steps that are part of a literature search for relevant data.

   a. Develop a reporting form on which the staff of a school or school district can report program suggestions that they feel are related to the vocational curriculum.
   b. Review at least eight of the following sources of information and briefly describe the type of data that can be found in each.

American Vocational Journal
The Agricultural Education Magazine
The Junior College Journal
Training in Business and Industry
Business Week
Accounting Digest
Advertising Age
Changing Times
Computer and Automation
Consumer Report
Data Processor
Sales Management
Fortune
Journal of Marketing
Journal of Retailing
Marketing and Communication
Taxation for Accountants
Journal of Business
Industrial Arts and Vocational Education Journal
American Journal of Nursing
Nursing Outlook

| | |
|---|---|
| Dunn's Review of Modern Industry | Nursing Research |
| The Office | Nursing Education |
| Nation's Business | R N |
| Comprehensive-Community College Bulletin | School Shop |

c. Develop a form for monitoring press and government listings of employment opportunities and vacancies.

3. Refer to Activity 2 for Goal 4.4 when completing this activity. The purpose of this activity is to give you an opportunity to complete most of the steps that are part of an interest survey. You may continue with the subject area used for Activity 2 or you may select a new target population such as high school seniors or veterans.

   a. Develop the following before conducting your survey:

      (1) question forms and necessary survey instruments
      (2) charts showing possible occupations
      (3) introductory letter requesting assistance
      (4) map showing geographic area to be surveyed
      (5) time schedule
      (6) advisory committee
      (7) plan for reporting results

   b. Conduct an interest survey using one of the following methods:

      (1) mail survey
      (2) telephone survey

   c. Analyze and tabulate the results. Write a three- to five-page paper describing the results of your survey.

# Part III:

# Group and Classroom Activities

# PART III
# GROUP AND CLASSROOM ACTIVITIES

## Classroom Activities

NOTE: The following activities are designed for use in the classroom to stimulate discussion on specific topics covered in this module. The activities are designed to be used following student self-study; however, depending on the background and abilities of students, these activities may not require previous study. All classroom activities are keyed to the content outline to indicate an appropriate point at which they might be presented.

1. The class should divide into small groups according to vocational interests (home economics, distributive education, business and office occupations, trades and industry, etc.) Each group should then go to the library for about one hour to locate those sources of employment data most useful for their area of vocational concern. Sources of useful information might include journals, reports, or studies. Next, each group is to assign priorities like the following to these sources:

   a. source worth subscribing to;
   b. source worth reading regularly;
   c. source worth reading occasionally;
   d. source not worth referring to.

   Lists of sources, with the assigned priorities, should be presented to the rest of the class.

2. The class should divide into groups of about five students. Each should be provided with a map of the county or the state. Each group is to specify the geographical area of the map they would use if they were conducting a manpower needs survey and why.

3. The class should divide into the same groups that were formed in Classroom Activity 2. Each group should be provided with a map of the county or the state. Each group is to specify the geographical area of the map they would use if they were conducting a manpower supply or population needs and interests survey and why.

4. In the past a frequent criticism of vocational and technical education programs was that they were developed solely to meet the needs of the "establishment" for cheap manpower. It was alleged that program and curriculum development occurred in response to local business and industrial needs, not in response to the real needs of students.

   The class should divide into two groups. One group must prove that vocational education programs should be designed to meet the needs of local business and industry and the other that vocational education should be designed to meet the needs of students. Each group should present its arguments, then debate the issue.

   Discussion: Obviously vocational and technical education must be responsive both to manpower needs, based on economic and socio-political requisites, and to student preferences. And although neither business nor industry can expect public education to train new employees specifically for it, both expect commonly required skills to be taught.

## Discussion Questions

A. What is the relationship of geographical proximity of jobs to decisions as to which skills to teach in vocational programs? For instance, under what conditions would you provide a specific program when the employer is 20 miles away?

(Many times vocational curriculum planners plan training programs even if specific jobs are not available in the immediate geographical area. For instance, if a large employer in your area has a factory 50 miles away but provides tremendous job opportunities, you might consider offering a program to teach the required skills.)

B. What do you do when a survey of high school students' career interests shows that 70% of them are planning on careers in professional fields, which comprise only 15% of the jobs available in the world of work? How do you build a program of vocational education at the high school level when the unrealistic career expectations of students are completely at odds with the reality of their own abilities and the facts of career distribution?

(When discussing this question, consider the following points:

a. cost of program;
b. transferability of skills to other occupations;
c. possibilities for self-employment;
d. the right of students--for example, to move out of the area;
e. the role of vocational education in supporting community or business needs.)

C. What sources of data have you found to be useful for gathering manpower information? What professional journals, reports, surveys, or studies would you recommend?

(Students should suggest local and national sources of employment data that are relevant to both their individual fields and to vocational education in general. These sources should be read regularly.)

D. Which approach to assessing manpower needs do you think is most effective for determining:

a. national manpower needs?

b. local-regional manpower needs?

(National needs are best determined by econometric studies and employer surveys. Local-regional manpower needs are best determined by employer surveys and job vacancy surveys.)

E. How might David Kidder's six criteria be applied to the activities of a local district vocational administrator engaged in manpower forecasting? Which are most critical and which are least critical?

(The following points should be discussed:

1. The forecasting model should be simple enough to be used frequently and repeatedly.
2. Accuracy and an estimate of possible error should be an important part of the forecasting model.
3. All of the points are equally critical for a successful program.)

F. "It is more important to study and understand the student population than it is to study industry or specific jobs." Discuss this point of view.

(Both sides of this statement can be argued but both sides are critical. When an administrator ignores either the student population or the needs of industry, he increases the chances that his programs will be inappropriate. Program content must be decided by using the following rule: job performance requirements of the jobs available, minus the entry-level skills of the target population, equals the learning objectives of the vocational programs.)

G. What other methods can be used to determine student interests and needs? What techniques should be used for determining the interests and needs of high school students, college students, adult education students, and veterans?

(Conducting surveys, either verbal or written, is the most accurate, as well as the easiest, method for determining the interests and needs of students of any age. Occasionally the problem is one of finding sources of information on a specific group of students [for example, adult education students] to be used in a survey. In such a case, you might consider surveying employment agencies or departments of large companies. They will have a fairly good idea of student interests and needs as shown through recent job applicants. Community groups can also be considered a source of information.)

H. The follow-up survey is a traditional method of validating the effectiveness of vocational programs. A return that showed a high correlation between job placement and success and the vocational training in high school or community college, for example, was deemed to verify that the vocational training was a success. What factors in the real world should be considered in addition to placement?

(Other factors to consider include the following:

1. the state of the economy--are companies expanding?
2. unemployment figures--are more people trying to locate jobs when there are fewer vacancies?
3. student satisfaction with their career choice and life-style;
4. student interest and motivation to progress to more responsible jobs in their field;
5. students' feelings of responsibility to their employers and their community;
6. student moral commitment to honesty, good intentions and fairnesses--are they good employees in all respects?)

# Part IV:

# Student Self-Check

# PART IV
# STUDENT SELF-CHECK

## GOAL 4.1

1. Define the following terms:
    a. task analysis (4.11)
    b. occupational analysis (4.12)
    c. job analysis (4.13)
    d. instructional analysis (4.14)
    e. population needs analysis (4.15)
    f. job market analysis (4.16)

2. Differentiate between the following pairs of terms by explaining in what ways they are alike and in what ways they are different. (Goal 4.1)
    a. occupational analysis and job analysis
    b. task analysis and instructional analysis
    c. job market analysis and population needs analysis

## GOAL 4.2

3. Describe the type of information that can be found in the Dictionary of Occupational Titles. (4.21)

4. Describe the type of information that can be found in the Manpower Report of the President. (4.22)

5. List three sources of employment statistics that can be used for planning vocational education programs. After you list the three sources, briefly describe the contents of each, and describe how you would use it. (4.23

## GOAL 4.3

6. What is the purpose of conducting a manpower needs analysis before developing educational programs? (4.31)

7. Describe how employer surveys are conducted and used in vocational education. (4.31)

8. Describe how econometric studies are conducted and used in vocational education. (4.32)

9. Describe how job vacancy surveys are conducted and used in vocational education. (4.33)

10. Describe how extrapolation of trends surveys are conducted and used in vocational education. (4.34)

## GOAL 4.4

11. Why is manpower supply data or population needs analysis important to consider when developing instructional programs? (4.4)

12. There are several ways to obtain and assess population or manpower supply information. List and describe at least three ways to determine population interests and needs. (4.41)

13. Describe how to conduct an interest survey to determine manpower vocational interests. (4.42)

# Part V:

# Appendices

# PART V
# APPENDICES

## Appendix A:
## Possible Study Activity Responses

### GOAL 4.1

1a. a. task analysis - the process of determining the major tasks of a job as well as the tools, manuals, or other equipment required
b. occupational analysis - the process of determining the jobs that are performed in key occupations of a cluster
c. job analysis - the process of listing the steps or sequences of tasks that make up a job
d. instructional analysis - the process of analyzing the instructional requirements of a job. This involves writing objectives, as well as specifying required media and simulation exercises.
e. population needs analysis - the process of obtaining data about the employable population regarding career choices, skills possessed, and needs
f. job market analysis - the process of obtaining data about job market or employment opportunities including employer requirements for entry-level jobs and employer needs

b. a. occupational analysis and job analysis - Occupational analysis is a general type of analysis; it surveys clusters of related occupations. Job analysis is specific; only the tasks that make up one job are analyzed.
b. task analysis and instructional analysis - Task analysis studies the specific steps or skills that make up a job. Instructional analysis determines how and what to teach; it includes an analysis of the instructional requirements of the job.
c. job market analysis and population needs analysis - A job market analysis surveys the employment needs of business and industry. A population needs analysis surveys the needs and interests of the employable population.

2a. a. emerging employment opportunities
b. students' interests and needs
c. local resources and constraints

b. a. How important is the task for hiring, job success, and promotion?
b. How frequently is the task performed?
c. What proportion of employers want the task taught?
d. For what level of proficiency should the task be taught?

## GOAL 4.2

1a. (The specific response to this activity depends on your specific field of vocational education. Regardless, you should probably include some general vocational education journals such as the American Vocational Journal.)

b. (The specific response to this activity depends on your area of specialization. Regardless, you should most likely include the Chamber of Commerce and the State Employment Department.)

2. (The specific response to this activity depends on the particular community in which you reside and your area of specialization.)

3. (The specific response to this activity depends on the particular occupation you selected.)

4. (The specific answers to these questions depend on the resources that you selected for Activity 3.)

## GOAL 4.3

1. (The specific response to this activity depends on the manpower needs of your local community.)

2a. a. Employer surveys - survey in which forms are sent to employers in the local area requesting them to answer questions related to their manpower needs, entry-level requirements, training opportunities, etc.
b. Econometric studies - a sophisticated survey to determine long-term predictions of manpower needs. The statistics are gathered, updated, and studied by the Bureau of Labor Statistics.
c. Job vacancy surveys - a study that compares local job vacancies with national manpower needs to determine priority jobs needing trained personnel. The vocational curriculum specialist can compare local job vacancy rates to national trends.
d. Trends surveys - a survey technique that attempts to forecast future manpower needs by studying past manpower needs and supply. Because technology and industry change so quickly, past trends are not always a dependable guide for future planning, so this method is not recommended.

b. The assessment of manpower needs is a crucial step in the development of educational materials becuase this assessment informs program developers of the need for teaching specific tasks and job skills. Where there are manpower needs, skills can be taught; where there is an oversupply of manpower, training can be eliminated. The assessment encourages the efficient use of money, time, and effort.

## GOAL 4.4

1a. A procedure to monitor phone requests should include the following:

a. Develop a form for recording inquiries and requests.
b. Distribute the form to those who receive the calls--counselors, teachers, and administrators.
c. Instruct them how to use the form and what information to collect.
d. Periodically tabulate the results and prepare a report.

b. b

c. A procedure for gathering data on student withdrawals and dropouts should include the following:

a. Develop a form for interviewing students.
b. Inform those who will be in contact with the dropouts.
c. Analyze the interview data at the end of each semester.

d. A procedure for gathering data on student graduates should include the following:

a. Develop a form for interviewing graduates.
b. Interview the graduates.
c. Compile and analyze the data.

e. With less than 50% of survey forms being returned, responses do not always represent the views of the entire group.

2. The specific response to this activity depends on the characteristics of the target population you selected to study. You should, however, have completed all of the following steps:

1. identified a specific target population;
2. listed the questions to which you wanted answers;
3. decided which method of data collection would be most appropriate.

# Appendix B:
# Possible Self-Check Responses

## GOAL 4.1

1. Define the following terms:

   a. task analysis (4.11) - The process of determining the major tasks of a job and the tools, manuals, or other equipment required.

   b. occupational analysis (4.12) - The process of determining the jobs that are performed in key operations.

   c. job analysis (4.13) - The process of listing the steps or sequences of tasks that make up a job.

   d. instructional analysis (4.14) - The process of analyzing the instructional requirements of a job. This involves writing objectives specifying required media and simulation exercises.

   e. population needs analysis (4.15) - The process of obtaining data about the career choices, skills possessed, and needs of the employable population.

   f. job market analysis (4.16) - The process of obtaining data about job market or employment opportunities, individual employer requirements for entry-level jobs, and employer needs.

2. Differentiate between the following pairs of terms by explaining in what ways they are alike and in what ways they are different. (Goal 4.1)

a. occupational analysis and job analysis - Occupational analysis is a general, broad analysis that surveys clusters of related occupations. Job analysis is specific; it analyzes only the tasks that make up one job.

b. task analysis and instructional analysis - Task analysis studies the specific steps or skills that make up a job. Instructional analysis determines how and what to teach, including an analysis of the instructional requirements, or tasks required, of the job.

c. job market analysis and population needs analysis - Job market analysis surveys the employment needs of business and industry. Population needs analysis surveys the needs and interests of the employable population.

## GOAL 4.2

3. Describe the type of information that can be found in the Dictionary of Occupational Titles. (4.21)

   The Dictionary of Occupational Titles describes most common jobs in the U.S. Job descriptions include a description of the tasks that make up the job, training requirements, approximate income, and the future need for the trained employees.

4. Describe the type of information that can be found in the Manpower Report of the President. (4.22)

   The Manpower Report of the President describes the economic characteristics of manpower supply and needs in the U.S. It projects future needs for occupations and examines trends in the economy and executive plans for solving present and potential problems.

5. List three sources of employment statistics that can be used for planning vocational education programs. After you list the three sources, briefly describe the contents of each, and describe how you would use it. (4.23)

   (The specific responses to this question depend on the particular sources students select.)

## GOAL 4.3

6. What is the purpose of conducting a manpower needs analysis before developing educational programs? (4.31)

   A manpower needs analysis provides the vocational planner with the necessary data for deciding which skills should be taught to meet employers' needs for trained personnel. If programs are based on reliable data, students can be fairly certain to find jobs at graduation.

7. Describe how employer surveys are conducted and used in vocational education. (4.31)

   Employer surveys are used to determine which jobs are expanding and will provide openings for trained personnel. Employers are contacted, questioned about their employment needs at present and in the future, asked to specify the skills required for entry-level jobs, and asked to predict their future need and interest in vocational training programs.

8. Describe how econometric studies are conducted and used in vocational education. (4.32)

   Econometric studies are conducted by economists on the federal or

state level to determine employment and manpower trends. Extensive surveys are conducted to gather reliable data that can be used as a basis for economic planning.

9. Describe how job vacancy surveys are conducted and used in vocational education. (4.33)

   Job vacancy surveys can be used to identify those jobs that are short of trained manpower. Job vacancy surveys can be a simple survey of employers, a newspaper job ad survey, or an employment agency survey. Vocational curriculum specialists can easily conduct job vacancy surveys before planning vocational curriculum.

10. Describe how extrapolation of trends surveys are conducted and used in vocational education. (4.34)

    Extrapolation of trends attempts to forecast future needs on the basis of past trends. Because of changes in the job market due to rapid technological change and changing industry needs, this survey technique is not highly recommended for vocational education planning.

## GOAL 4.4

11. Why is manpower supply data or population needs analysis important to consider when developing instructional programs? (4.4)

    Manpower supply data shows what interests and skills potential students have. By comparing this data to manpower or employer demand data, vocational curriculum specialists can bridge the gap between the two. Ideally, the manpower supply characteristics will, after training, equal the manpower or employer demands.

12. There are several ways to obtain and assess population or manpower supply information. List and describe at least three ways to determine population interests and needs. (4.41)

    a. Monitor phone or mail requests for vocational programs.
    b. Follow up on students who have dropped out of programs.
    c. Follow up on students who have graduated from programs.

13. Describe how to conduct an interest survey to determine manpower vocational interests. (4.42)

    The following steps should be mentioned:

    a. Identify the sample to be surveyed.
    b. Outline the expected outcomes of the survey.
    c. Decide on the method of data collection: for example, personal interview, mail survey, telephone survey, etc.
    d. Develop a timetable for data collection.
    e. Appoint a committee to assist with data collection.
    f. Select the students to be surveyed.
    g. Design the survey forms.
    h. Try out the survey forms.
    i. Analyze the data and revise forms as necessary.
    j. Conduct the survey.
    k. Analyze and tabulate the results.

ED 009 196

☆GPO 692-181-1976